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U. S. MARITIME
COMMISSION
WEST COAST
SHIPBUILDING
Program

ACIFIC
ARINE
EVIEW

JANUARY, 1941 - Dec

V. 38

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STEEL FABRICATORS
SHIPBUILDING DIVISION
OS ANGELES, CAL. ORANGE, TEXAS

Designed For MARINE USE

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TUBBS Cordage Company
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- Select Fibre
- Proper Lubrication
- Greater Uniformity
- Water Repellent
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- Longer Wearing
- Rot Resistant
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Official Organ

Pacific American
Steamship Association

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PACIFIC MARINE REVIEW

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Dedication . . .

To the

United States Maritime Commission . . . Constructor and Conservator of the American Merchant Marine.

And to Its Chairman

Rear Admiral Emory S. Land, Co-ordinator of American Shipbuilding, we are respectfully dedicating this edition of PACIFIC MARINE REVIEW

VOLUME 38
No. 1

PACIFIC MARINE REVIEW

JANUARY
1941

Pacific Coast In the New Year

Pacific Marine Review extends to all its most hearty wish that each may find true happiness and prosperity in 1941.

We do this with a greater assurance that for most folks the wish will come true than has been the case for many years past.

In no year for the past two decades has there been such an upswing of Pacific Coast industries, business and employment as we are enjoying at present.

Shipbuilding is growing so rapidly that it is difficult to keep track of the increase—nearly a thousand per cent in a space of six months.

Airplane industry is showing a similar or even greater advance.

General contracting industry—roads, large buildings, shops, dams, bridges, power plants, shipyards running on the highest tempo since 1917.

Machine tool industry running three shifts—expanding its plants and still unable to meet the demand.

Lumber in greater demand than at any time in the last ten years.

And we might go on into every large manufacturing and industrial interest of the Pacific states and show practically the same condition.

All of this means more employment—more payroll—more business—more and more widespread prosperity.

In other pages of this issue we show the details of the billion-dollar program of shipbuilding now under order in Pacific Coast shipyards, and also somewhat of the future policies and plans that may greatly augment this program.

We wish to say from personal observation in close contact with Pacific Coast shipyard and industrial management that notwithstanding all of the smart cracks in press headlines and columns, and all of the view-with-alarm platitudes from Congressmen, there is no holding up of the National Defense Program by any of these factors. In the great majority of cases where hold up of construction occurs, it is due to one of these three causes: delayed delivery of materials or machinery, usually over a question of priority; delay of decision about design details by a Federal department; or labor difficulties.

The facts are that American industry in general, and Pacific Coast industry in particular, are just now indicating a remarkable ability to absorb the shock of tremendous demands for change in output, and to readjust their plants and their equipment for record production of new and different products.

So again our wish that 1941 may bring to you your quota of happiness and prosperity, and that it may bring to war-torn, suffering humanity a just and righteous peace.

Henry J. Kaiser, president
Todd-California Shipbuilding Corp.

British Order

Sixty 10,000

Huge Contract to

at Richmond, California

Both Yards Affiliate

For the past months there has been much rumor over proposed large-scale building in the shipyards of America for British interests. Many Pacific Coast locations have been spoken of as sites for shipyards in which these ships would be built.

Rumors about design and type have roamed all the way from special mystery submarines and torpedo boats to giant cargo vessels.

Some months back, various Pacific Coast firms were approached by contractors for bids on machinery and equipment, and the rumor fever grew apace.

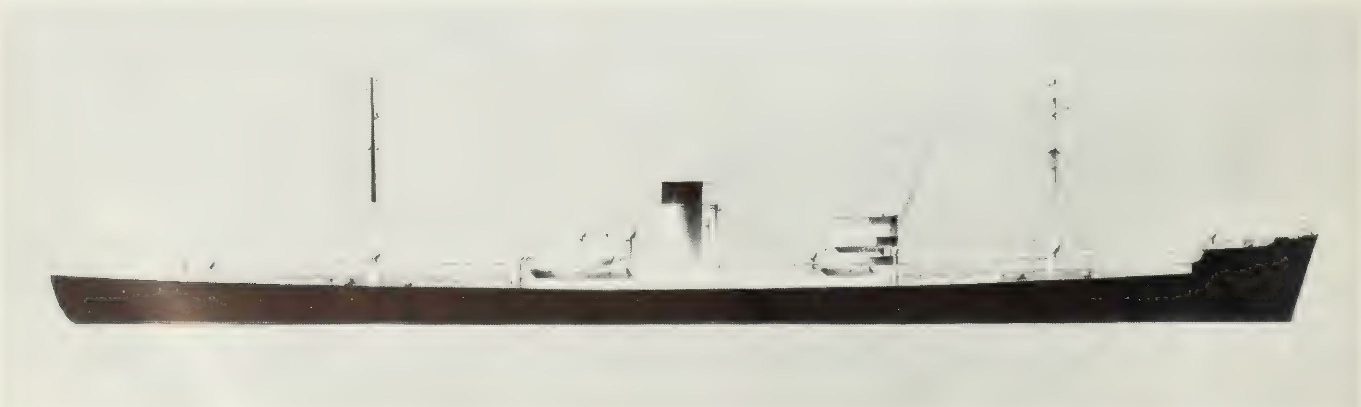
Then suddenly it was announced that a contract had been let for thirty simple cargo carriers to each of two corporations, both of which are affiliates of the Todd Shipyards Corporation.

In view of all this, we are very glad to publish the following official statement, together with portraits of executives and illustration showing artist's conception of the appearance of the new ships when finished—all issued by the Todd Corporation.

John D. Reilly, president of Todd Shipyards Corporation, 1 Broadway, announced on December 19 that contracts had been signed between two affiliates of Todd Shipyards Corporation and the British Purchasing Commission for the construction of sixty cargo vessels 416 feet long, 57 feet beam, of 10,000 dwt, for Great Britain.

The contracts were approved by the National Defense Commission, the U. S. Navy Department and the U. S. Maritime Commission.

Thirty of the vessels will be built by the Todd-California Shipbuilding Corpo-



An artist's conception of the appearance of the standard British cargo ship, sixty of which are to be built in two new shipyards. They will be 416 feet long, 57 feet beam, and will have a total deadweight capacity of approximately 10,000 tons

Dwt. Cargo Steamers

Two New Yards — at Bath, Maine

to Todd Shipyards Corp.

William S. Newell, president, Todd-Bath Iron Shipbuilding Corp.

•

Joseph Haag, Jr., vice president of Todd Shipyards Corporation and of both new affiliates

ration, Richmond, Calif., and the remaining thirty by the Todd-Bath Iron Shipbuilding Corporation, Portland, Maine.

This is the first time since the World War that ships ordered for the British Government have been constructed in the United States.

Both of the new Todd yards are being constructed from scratch, work being started on each on December 20, and plans call for the completion of both in four months. Within two and a half months of the start of work on the yards, the first keels will be laid.

Signing of these contracts means that work will be provided for 5,000 or more American shipyard workers in each yard.

Such speed as envisaged in the laying of the keels within 2½ months of December 20, 1940, was brought about by thorough study and planning during weeks of conferences between representatives of Todd Shipyards Corporation and the British Purchasing Commission.

On the one side were John D. Reilly; Henry J. Kaiser, director of Seattle-Tacoma Shipbuilding Corporation, who becomes president of the Todd-California Shipbuilding Corporation; and William S. Newell, head of the Bath Iron Works, Inc.; and for the British Purchasing Commission, R. Cyril Thompson, R. R. Powell and Henry Hunter. Mr. Newell becomes president of the Todd-Bath Iron Shipbuilding Corporation. Joseph Haag, Jr., vice president of Todd Shipyards Corporation, becomes vice president of both new Todd affiliates.

The vessels, designed by Messrs. Gibbs & Cox, noted naval architects, will be built to British Lloyd's requirements and specifications, and will be under the inspection of William Bennet, Lloyd's Chief Surveyor in the U. S. Each vessel will cost approximately $1,600,000.

So ends the simple statement of a simple contract to build sixty ships for $100,000,000 in two shipyards yet to be built and over 3,000 miles apart.

We are informed:

That wherever possible, local shops will be used to build machinery and equipment for these vessels.

That they are to be simple, slow-speed steamers with triple-expansion engines, Scotch marine type boilers (probably coal-burning), steam-drive auxiliaries and small electric light plants, much like the 8800-tonners of Shipping Board days.

Maritime Commission

A Frank Discussion
Ship Construction

by Rear Admiral Emory S. Land, U. S. N. (Ret.)

Emory S. Land,
Chairman, U. S.
Maritime Commission

This article is the concluding part of a paper read before the annual meeting of the Society of Naval Architects and Marine Engineers at New York on November 15, 1940.

Early in 1938 a ten-year building program was established. In the summer of 1939, when it became evident that a difficult situation in Europe would result in armed conflict, the Commission, with the approval of the Administration, moved forward its building projects originally contemplated for the calendar year 1940, so that contracts were placed for about 67 ships in the fall of 1939. Therefore, there remains to be constructed the larger part, at least in number of ships, of this so-called ten-year building program.

Some Important Considerations

In an earlier part of the present discussion, the early design development of the so-called standard types of ships, viz., C-1, C-2 and C-3, was described. Since bringing out these ships, the Commission's program has become much more definite in that now and probably throughout the remainder of the program the design work done will be for specific routes. While this somewhat simplifies the problem of design, it also makes possible and necessary the detailed study of each route. This brings into the picture, in an effort to secure the most reliable information, the Divisions of Research, Operations and Traffic and Finance, in addition to the Technical Division. While securing an agreement regarding principal characteristics with the members of such groups is more difficult than would be the case were only one Division involved, the characteristics reached as the result of an agreement between these Divisions have a much more secure foundation than would be otherwise possible. It is felt that this method of approach will probably obtain throughout the remainder of the Commission's design program.

The Number and Types of Ships Contemplated

In laying out the long-range program, it was necessary first to consider and accept certain basic objectives. These are outlined in the following:

The standard C-2 cargo motorship Shooting Star illustrates the sturdy, business-like, efficient appearance of this U. S. M. C. design

Policies of the Program of and What is Ahead

(a) Earmark as a charge against National Defense those costs properly chargeable to that category.

(b) Avoid a shipbuilding boom.

(c) Keep shipbuilding prices on a reasonable and stable basis.

(d) Secure wide competition.

(e) Consider propriety of allocation to take care of regional building conditions.

(f) Rehabilitate certain private yards where such action is economically justified.

(g) Consider desirability and/or necessity of new shipyards of the assembly type rather than complete building type, especially if private funds can be interested in such yards, this idea with particular reference to regional needs, both economic and national.

(h) Encourage the maximum possible building by private interests.

(i) If (h) above fails, the Maritime Commission to initiate and undertake the construction most necessary to fulfill urgent naval needs.

(j) Consider construction for inland waterways, lakes and rivers from the guaranteed mortgage angle (Cochrane Bill).

Note: Order of Priority:

(1) Foreign Commerce.

(2) Domestic Commerce.

(3) Lakes, rivers, inland commerce.

Tabulation of Ships Contemplated and Their Intended Services

Tabulations showing the so-called ten-year program as mapped in January, 1938, are given in the table herewith. It was as definite as it could be made at the time, and quite comprehensive. It met both civil and naval requirements. It recognized both peacetime and emergency needs, and took account of obsolescence.

It will be recognized that actual construction has exceeded the provisions of the plan, due primarily to the setting ahead last year (1939) of about 50 ships.

Merchant Marine Shortages (Navy Department Letter)

(a) Essential naval requirements, 17 vessels.

(b) Naval and civil requirements, 443 vessels.

The naval and civil requirements comprise the following:

Tankers	270
Passenger	14
3-Deck cargo	11
Cargo	148
Total	443

(c) In addition, at least 200 vessels of existing fleet are so obsolescent as to require replacement in the next five years.

(d) Immediate merchant construction desired by Navy: 65 ships capable of conversion for special naval auxiliaries plus an indefinite number (see (b) above) of cargo ships. These 65 are made up of:

Tankers	24
Provision, ammunition and special cargo	18
Tenders, seaplane, destroyer, submarine	19
Aircraft carrier	3
Auxiliary cruiser	1
Total	65

(e) In addition to the foregoing, two distilling ships and one net-layer are desired.

The Maritime Commission proposes to meet these requirements as follows:

(a) 24 tankers—23 contracted for.

(b) 3 aircraft carriers—Ambassadorial ships for South America—Plans under way.

(c) The 38 other vessels (tenders, ammunition, special cargo) are covered in the ten-year program in the foregoing tables.

(d) One distilling ship is covered in connection with the training ship conversion of a laid-up fleet vessel; the net-layer can be cared for in prospective private new construction.

(e) The indefinite number of cargo ships are covered in the ten-year program.

A resume of the ten-year program of the United States Maritime Commission, the Navy's needs (peacetime and emergency), and the joint needs of civil and Navy, may be reviewed as follows:

(a) Navy needs now (peacetime), 65 ships.

(b) Civil and Navy needs (emergency), 443 ships.

(c) Needs of (b) plus obsolescence 443 + 200 = 643 ships.

(d) U. S. Maritime Commission program, 506 ships.

(e) Average of (a), (b) and (c), 533 ships.

After making reasonable allowances for ships constructed under the 1920 Act and under the 1928 Act, we may properly assume 500 ships to be constructed over a ten-year period, and our program would make available about 50 ships a year.

In types this would be an average per year as follows:

C-1	C-2	C-3	R-2	P-1	P-2	P-3	P-4	Total
15	19	5	1	2	6	1	1	50

NUMBER AND TYPES OF SHIPS CONTEMPLATED AND THEIR INTENDED SERVICES

ATLANTIC

	No. of vessels	Speed, knots	Type	Tons	Service-trade route or trade area
P-4	3	24	Passenger and express	34000–26000 gross	New York–Channel Ports/Hamburg/Bremen
P-4	3	22	Combination	12000–14000 gross	New York–East Coast South America
P-3	3	20	Combination	12000 gross	New York–Channel Ports/London
P-2	4	18	Combination	12000 gross	New York–Mediterranean
P-2	4	18	Combination	10000–12000 gross	New York–West Coast South America
P-2	24	16–18	Combination	8000–10000 gross	North Atlantic–West Indies and Central America
P-1	3	16	Combination	8000–9000 gross	North Atlantic–South Africa
P-1	2	16	Combination	7000–8000 gross	North Atlantic–West Coast South America
P-1	10	16	Combination	12000 gross	New York–Honolulu–Asia/Straits Settlements Ceylon/India/Egypt/New York
C-3	4	16	Cargo	9000 D.W.	North Atlantic–Liverpool/Manchester/Glasgow
C-3	10	16	Cargo	9000 D.W.	North Atlantic–France/Netherlands
C-3	8	16	Cargo	9000–10000 D.W.	Atlantic Coast/China/Japan and Philippine Islands
C-3	6	16	Cargo	9000–10000 D.W.	Atlantic Coast/New Zealand/Australia
C-2	7	15	Cargo (12 passengers)	9000 D.W.	North Atlantic/Scandinavia/Finland Poland
C-2	12	15	Cargo	9000 D.W.	North Atlantic/United Kingdom/Continent
C-2	10	15	Cargo (12 passengers)	9000–10000 D.W.	North Atlantic/Mediterranean/Russia/Near East
C-2	7	15	Cargo	9000 D.W.	Atlantic Coast/East Coast South America
C-2	4	15	Cargo (12 passengers)	9000–10000 D.W.	Atlantic Coast/India
C-2	5	15	Cargo	8000–9000 D.W.	South Atlantic/United Kingdom/Continent
C-1	6	14	Cargo (12 passengers)	8000–9000 gross	Atlantic Coast/West Africa
C-1	8	14	Cargo	8000–9000 gross	Atlantic Coast/South Africa
C-1	3	14	Cargo	8000–9000 gross	Atlantic Coast/West Coast South America
				GULF	
C-3	15	15	Cargo	8000–9000 D.W.	Gulf/United Kingdom/Continent
C-3	3	15	Cargo	8000–9000 D.W.	Gulf/Mediterranean
C-3	7	15	Cargo (12 passengers)	8000–9000 D.W.	Gulf/East Coast South America
C-3	4	15	Cargo (12 passengers)	12000 D.W.	Gulf/China/Japan/Philippine Islands
C-1	3	14	Cargo (12 passengers)	8000–9000 D.W.	Gulf/West and South Africa
				PACIFIC	
P-4	3	22	Passenger and express	22000 gross	California/Australia/New Zealand via Honolulu
P-4	4	22	Passenger and express	22000 gross	California via Honolulu–Five principal ports of Orient[2]
P-3	3	20	Combination	16000 gross	California/Hawaiian Islands
P-2	4	18	Combination	12000 gross	Puget Sound via Honolulu–Five principal ports of Orient
P-2	10	18	Combination	12000 gross	California/New York via Mediterranean/India/Strait Settelments/Orient
R-2	6	18	50 per cent refrigerated space	8000–9000 D.W.	Pacific Coast/United Kingdom/Continent
C-3	8	16	Cargo	9000 D.W.	Pacific Coast/Asia/Dutch East Indies/India
C-3	10	16	Cargo	8000–9000	California/Columbia River–Five principal ports of Orient
C-2	15	15	Cargo	8000–9000 D.W.	Pacific Coast/Hawaiian Islands
C-1	6	13	Cargo	8000–9000 D.W.	Pacific Coast/Australia/New Zealand via Honolulu
C-1	10	13	Cargo	8000–9000 D.W.	North Pacific Ports–Japan/North and South China/Philippine Islands
C-1	4	13	Cargo (12 passengers)	9000 D.W.	Pacific Coast/West Coast South America
				COASTWISE AND INTERCOASTAL[3]	
P-2	30	18	Combination	5000–12000 gross	Atlantic Coast/Gulf/West Indies/Caribbean
P-1	6	16	Combination	8000–10000 gross	Pacific Coast–Canada/Alaska, etc.
C-1	25	13	Cargo	4000–6000 D.W.	Coastwise/Canada/Alaska
C-1	20	13	Cargo	2500–4000 D.W.	Coastwise
C-1	40	13	Cargo	5000–7000 D.W.	Gulf–Atlantic Coast
C-1	25	13	Cargo	5000–7000 D.W.	Atlantic Coast/Canada
P-3	3	20	Combination	10000–12000 gross	Intercoastal U. S.
C-2	100	14–16	Cargo	8000–9000 D.W.	Intercoastal U. S.

---

[2] Five principal ports of Orient—Yokohama, Kobe, Shanghai, Hong Kong, Manila.
[3] Including nearby foreign.

SUMMARY OF TABULATION OF SHIPS CONTEMPLATED

	Atlantic	Pacific	Gulf	Total	Coastwise and Intercoastal	Grand Total
P-4	6	7	0	13	0	13
P-3	3	3	0	6	3	9
P-2	32	14	0	46	30	76
P-1	13	0	0	13	0	13
R-2	0	6	0	6	0	6
C-3	28	22	0	50	0	50
C-2	45	15	29	89	100	189
C-1	17	20	3	40	110	150
	144	87	32	263	243	506

P-4—22-knot passenger and cargo
P-3—20-knot passenger and cargo
P-2—18-knot passenger and cargo
P-1—16-knot passenger and cargo
C-3—16-knot cargo
C-2—15 knot cargo
C-1—14-knot cargo
R-2—16-18-knot refrigerator

DEDUCTIONS FROM FOREGOING TABULATION—44 SHIPS

Vessels Built under Merchant Marine Act of 1920

Coastwise—Intercoastal
8 ships—P-2
4 ships—P-1
1 ship —R-1 (combination-refrigerator)
13

Vessels Built under Merchant Marine Act of 1928

Atlantic	Pacific	Intercoastal
2 ships—P-4	4 ships—P-4	2 ships—P-4
7 ships—P-2		1 ship —P-3
1 ship —P-1		5 ships—P-2
		7 ships—R-2 (combination-refrigerator)
		2 ships—Seagoing car ferries
10	4	17

It will be noted that the yearly cost as estimated is about $140,000,000. Under proper conditions of a continuous, efficient shipbuilding program, this should be reduced to about $125,000,000 per annum.

The Future

When the preparation of this paper was begun, it appeared reasonable to anticipate a rather orderly progress from year to year. In this forecast, the replacement of old tonnage in due course, such as the Brazil, Argentina and Uruguay in the South American passenger cargo trade, or the Manhattan and Washington on the North Atlantic, stood out prominently.

The continued building of certain adaptable types of ships, and the cooperation with coastwise operators to produce and place in service tonnage suited to the trade, were also definitely accepted.

Cooperation with the ideas and needs of the Navy Department toward national defense was an accepted fact, though not quite so tangible.

With the series of successes scored by the Germans during the winter, spring and early summer of 1940, the future of the Maritime Commission and its long-range program became somewhat confused. For a time there was more than a slight tendency on the part of the Navy Department to forget its need of merchant type auxiliaries in a rather unreasoning policy of building naval vessels exclusively.

The Maritime Commission on its part held that most types of merchant ship would be of definite value in time of war, and that, should the present war prove long or short, both the normal cargo vessel of the C types and the passenger cargo vessels of the C-3 conversion types would be national assets. The same statement held for the large fast tankers.

Further, it was fairly evident that inexpensive types of cargo carriers for the coastwise service are of real value whether peace or war obtained.

However, it was also recognized that large vessels, which must always be designed for a specific service, and which require for their construction exceptional yard facilities and long-term contracts, constituted a difficult problem.

Could we expect the commercial conditions of today to prevail after the European emergency should pass? Had we a right to occupy with non-combatant vessels the building facilities of a large yard and the energy of its technical staff over a period of three to four years?

The answer to these questions seemed to be that a large fast merchant ship of proper design could be built and completed for airplane carrying and operating purposes, so that, if necessary, she would be a valuable naval unit.

On the other hand, after the emergency has passed, such a ship, having great steaming radius, great cargo capacity and high speed, providing her draft be not excessive, can hardly fail to furnish satisfactory transport for freight and passengers on some one of the great water routes of the world.

There are some further preparations for future work now in hand at the Commission, but they are naturally tentative. For the moment the future policy, except as already described, is one of watchful waiting.

While the carriage of passengers is a problem of equal importance to that of freight carrying, and of even greater interest in some respects, the part to be played by the Commission in its development is by no means so clear at the present time, because of:

(a) Great cost of large modern passenger vessels.

(b) Lack of sufficient facilities in shipbuilding plants capable of constructing these vessels with the large Navy program under way.

(c) Possibilities of aircraft and the rapid adaptation of aircraft to the passenger service.

Commission Policy as to Number of Merchant Shipyards and Savings From Standardization

The policy of the Maritime Commission has been that we should have at least two going building yards for merchant vessels in the South and at least two on the West Coast. We now have three in the South and five on the West Coast.

The Commission has no funds and no authority for the rehabilitation of old yards or starting new yards; private interests are starting new yards. We have been content to leave matters as they are, feeling that in the United States, with the program in hand, plus the naval program, it was quite possible to take care of shipbuilding in a proper and efficient manner without any further expansion or extension, except such as might prove desirable in existing yards. However, it was recognized that a demand for increased output for national defense might greatly alter the situation. Even so, it was felt to be most desirable to avoid such an over-expansion in shipbuilding facilities as took place in 1917-1918.

In carrying out the program thus far it has been possible gradually to place contracts for groups of vessels and thus simplify plan work per ship, the ordering of material, the control of construction in the yard, the purchase of equipment and outfit, etc. The reduction in cost per ship thus effected is appreciable until a group total of five or six ships has been reached.

The cost of ships in this country is high, probably it will always be high, but we have very materially reduced the cost of these ships by standardization. It costs anywhere from a hundred to two hundred and fifty thousand dollars to prepare the plans for a ship. If these plans do not have to be originally developed independently for each ship, there is a very material saving; not a saving of the total cost of plans by any means, because every country and every shipyard has its own way of doing things, and they wouldn't follow in Mr. A's yard what Mr. B does. Nevertheless, a major saving is made in plans alone and in design work by standardization.

The Commission is endeavoring to follow its ships into service, to watch the actual performance of machinery, hull and equipment, and to consider and record for future use all reports as to failure or unsatisfactory operation in service. To this end it has organized a Performance Section within the Technical Division, and has provided for surveys by its Division of Maintenance and Repairs, and inspections and reports by representatives of the Division of Operating Personnel.

When a vessel is completed and ready for delivery to the Commission, a series of trials is conducted by the Commission's Trial Board to test the various operating features and to inspect the machinery and equipment. Thus the Commission assures itself that it is acquiring the most satisfactory possible product for the large sums of governmental and private funds which it is expending. The Trial Board keeps records of all trials, and this material has proved valuable in designs for later ships and in improvement of designs for existing types of ships.

Training Personnel for Service in the American Merchant Marine

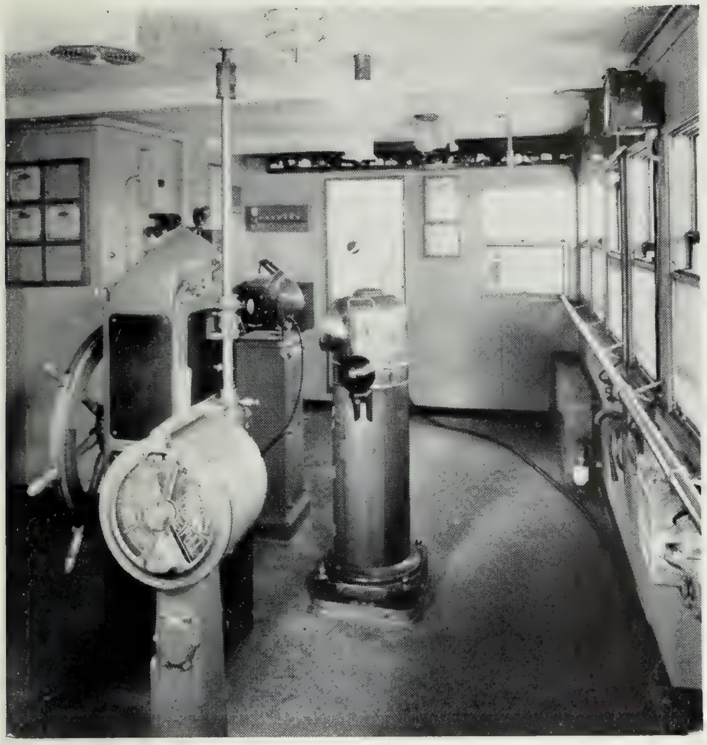
Section 101 of the Merchant Marine Act, 1936, declares that it is necessary

After end, main lounge →

S. S. PRESIDENT JACKSON

Forward end, main lounge ↓

These two views illustrate the modern motif in passenger vessel interiors. This beautiful room is achieved in the slightly enlarged deck house of a C-3 standard cargo steamer. The pilasters are all ventilating ducts



All Maritime Commission ships are fitted with pilot houses featuring maximum visibility and ample room for efficient arrangement of modern navigation equipment

for the national defense and development of its foreign and domestic commerce that the United States shall have a merchant marine "* * * manned with a trained and efficient citizen personnel." The Maritime Commission, which administers this policy, is therefore charged with the responsibility for such training.

Pursuant to this mandate, and as authorized by Section 216 (a) to (d), inclusive, of the Merchant Marine Act, 1936, as amended, the Commission has established an organization for training presently licensed and unlicensed seamen and apprentice seamen, known as the United States Maritime Service, and a Cadet Training System to train American citizens to become licensed officers.

The United States Maritime Service is maintained and its rules and regulations are prescribed by the Maritime Commission, and by arrangement with the Secretary of the Treasury, is administered for the Commission by the United States Coast Guard. Training stations for presently licensed officer personnel are established at Fort Trumbull, New London, Conn., and at Government Island, Alameda, Calif., and for presently unlicensed personnel at Hoffman and Swinburne Islands in New York Harbor and at Alameda, Calif. A course of three months' training is given, and those successfully completing the course and who serve at least eight months in any succeeding year in the merchant marine are privileged to return annually for an additional one month's "freshening" course and are entitled to receive one month's extra pay at their established rating as retainer pay for continued membership in the Maritime Service. While in training, officers receive $125 per month and unlicensed personnel $36 per month, which is subject to increase for specialized services. Enrollees are also furnished with clothing, quarters and subsistence, medical and dental care, and the use of recreational facilities. Since these stations were established, they have enrolled a total of 795 officers and 3598 unlicensed personnel.

The United States Maritime Service also maintains stations for training young American citizens between the ages of 18 and 23 years as apprentice seamen in the duties of the deck, engine, steward's and radio departments. Under present regulations, apprentices are selected from enrollees of the Civilian Conservation Corps throughout the 48 states who have served with that organization for at least one year and who have good records. Appren-

A typical C-3 standard cargo carrier is the motorship Mormacpenn of the Moore-McCormack Lines tice stations are located at Gallups Island in Boston Harbor and at St. Petersburg, Fla. A third station is in preparation at Hueneme, Calif. Three training ships are attached to these stations, the American Seaman, the Joseph Conrad and the Tusitala. A fourth training ship, to be known as the American Sailor, is under conversion for use at Hueneme, Calif. In addition, various Coast Guard vessels are used for training purposes at the several stations. Nine hundred apprentice seamen have been enrolled to July 1, 1940. Their courses cover periods of from 8 to 12 months, and while in training apprentices receive $21 a month, which may be increased to $36 for additional services. Clothing, quarters, subsistence, medical and dental care and the use of recreational facilities are also furnished.

The cadet training system maintained and operated by the Maritime Commission offers a four-year course to American citizens between the ages of 18 to 25 to become licensed officers of the merchant marine of the United States in a status of cadets on Government-owned and subsidized vessels, and, in cooperation with other governmental and private agencies, on other vessels, and, for instructional purposes only, in shipyards, plants and industrial and educational organizations, under rules and regulations prescribed by the Commission and upon such terms as the Commission may arrange. Candidates for appointment as cadets are selected by national competitive examinations held approximately once a year. They must have 16 specified standard high school credits, with perfect eyesight, good health and good moral character. Upon successful completion of the course they are entitled to sit for an examination to secure a license as an officer, but are usually commissioned as cadet officers, in which capacity they serve approximately one year. To July 1, 1940, 333 cadets have been appointed. They receive $50 a month for the first two years and $60 a month for the last two years of their course. When appointed as cadet officers, they receive $75 a month for one year and $90 a month if they serve in that capacity for a longer period. They must purchase their own uniforms and textbooks.

State nautical schools are maintained with Federal aid and the use of training vessels lent by the Commission in the States of California, Massachusetts, New York and Pennsylvania. These schools have been brought into close liaison with the Commission's training program, and their graduates, for the most part, are commissioned as cadet officers and serve under the cadet training system for approximately one year.

Cadets and cadet officers are eligible for appointment as ensigns in the Merchant Marine Naval Reserve under rules and regulations prescribed by the Navy Department. United States Maritime Service enrollees who successfully complete their courses and are recommended by the superintendents of the several training stations are also eligible for appointment at their proper ratings in the Merchant Marine Naval Reserve, under regulations prescribed by the Navy Department.

The Commission also maintains a course in merchant ship gunnery at its station at Swinburne Island in New York Harbor in liaison with the Navy Department.

In addition, the Commission gives correspondence courses which are available to enrollees in the United States Maritime Service and to cadets. These courses, conducted for the Commission by the Coast Guard Institute at New London, Conn., are also supplied for a small registration fee to any seaman in the merchant marine who makes application therefor.

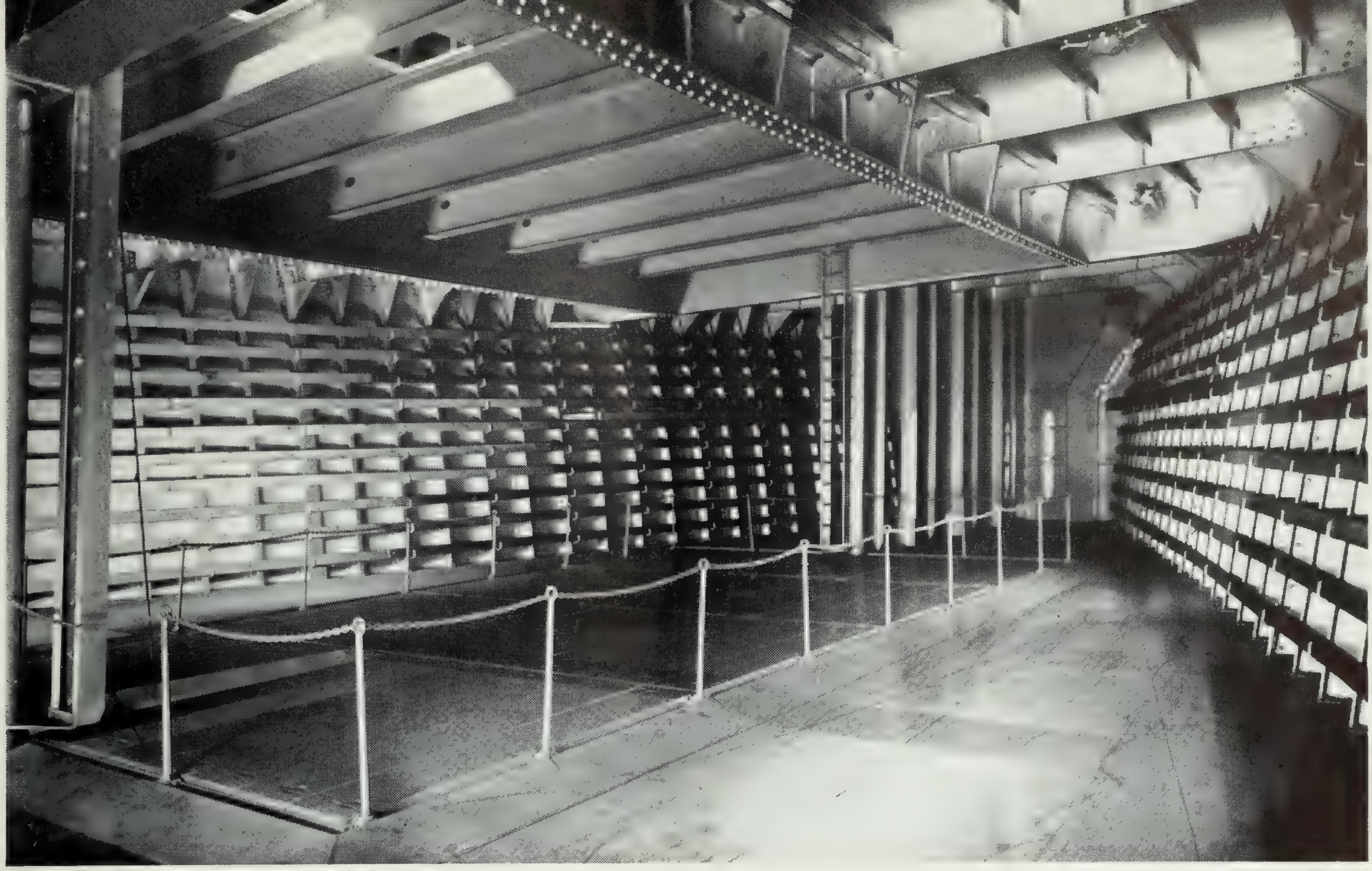
The Commission's training program has been in operation for more than a year, with some phases of it, for nearly two years. It has met with considerable success, and fulfills a very important function in the whole merchant marine picture. We are building ships which we truly feel are second to none. These ships, however, can function properly and efficiently only through employment of crews whose capabilities, loyalty and interest are commensurate with their responsibilities. It is my feeling that a majority of our seamen, and a very substantial majority, are above reproach in the qualities which I just mentioned.

Modern shipbuilding technique emphasizes welding of large assemblies on welding racks alongside or at the inshore end of building ways. Thus the chief factors in a shipyard are ample room, ample welding facilities and large crane capacity

Vessel Personnel

The commission, in its program of rehabilitation of the merchant marine, is establishing equitable manning and wage scales and reasonable standards of living for vessels' personnel. Crews quarters on both Government-owned ships and subsidized vessels have been greatly improved. Quarters on all of the new ships are unexcelled.

The policy of the Maritime Commission regarding living conditions on board its new ships is to make the greatest possible improvements. This leads to greater efficiency and contentment on board.



Lower tween decks of hold No. 1, standard C-3 cargo vessel

Here are some of the features accomplished by the Commission:

All rooms located as outside rooms.

Fireproof construction throughout.

Better natural and mechanical ventilation of quarters and other spaces.

Insulation and sheathing of house sides and shell in way of quarters.

Lights at head of berths, wash basins in all rooms, together with mirrors and lights for shaving.

Combination mess and recreation rooms for eating and lounging.

Adequate toilet and shower facilities, and many other features, such as new and modern furniture in keeping with the trend of the times.

The division of Maritime Personnel conducts research and hearings necessary to develop data for recommendations for manning and wage scales, living conditions and other standards for vessel personnel.

Facilities Valuable in Construction and Operation

No organization can maintain high standards of performance without definite and constant effort to acquire and classify knowledge.

The Division of Research gathers, analyzes and makes recommendations on information pertaining to shipping, with particular reference to the essentiality of trade routes; the differentials between foreign and domestic operating and construction costs; the nature and amount of foreign government aid rendered in shipping and the facilities of foreign and domestic ports; gathers, tabulates and disseminates shipping statistics.

The Section of Special Studies is engaged in detailed study of coastwise, intercoastal and inland waterways transportation, and is responsible for detailed studies of a special nature.

Further, the Materials Section of the Technical Division is responsible for a continuous program of investigation of shipbuilding materials of all classes and purposes. The results of these investigations and tests are compiled and recorded for future reference.

Also, there are under way various other special investigations, such as:

Vibration frequencies of hull and machinery.

The control and disposal of uptake gases.

Sound levels and insulation.

The comprehensive strength of flat plate panels.

Another means through which the Commission endeavors to maintain its standards is through special education of its personnel. The Commission has had two men at the Massachusetts Institute of Technology the past school year, and is following there what Congress authorized for the Weather Bureau and one or two other departments of the Government. Specifically, it is trying to improve its marine engineering. This year (1940) the Commission has a marine engineer at the Massachusetts Institute of Technology and two naval architects at the University of Michigan.

National Policy

The American merchant marine is not the property of a number of private business concerns. It is an instrument of national policy, valuable to the country both for furtherance of its commercial interests and for its protection in time of emergency. The study and continuous improvement of the merchant marine, its operations and its personnel, are a major contribution to the strengthening of the nation. Ocean transportation of goods and passengers, both to foreign countries and between our own ports, is a natural and economically desirable phase of our national life.

The Government, through the Maritime Commission, the shipping industry and shipbuilding industry, possesses a remarkable opportunity for service to the nation. The manner in which this opportunity is used during the next few years will undoubtedly affect the national welfare for decades to come.

J. E. Schmeltzer

Engineering Features of *Maritime Commission*

by J. E. Schmeltzer
Associate Technical Director, U. S. Maritime Commission

The power to propel a ship increases approximately as the cube of the speed; therefore, when the speed is increased above current practice, the power is also increased considerably. To make such a ship practical, it is necessary to design an economical power plant, as otherwise the increase in fuel consumption per knot would prohibit the increase in speed of the ship.

The Commission's first consideration, therefore, in the design of the main power plant for its cargo ships was to arrive at the most economical design consistent with low first cost, available materials, weight and manufacturing facilities. This study resulted in two fundamental designs; namely, a steam plant, using cross-compound geared turbines, and a diesel plant, utilizing in one case the direct-connected Sun Doxford engine and, in the other, geared diesels.

Steam Propulsion

The steam plants on the Commission's C-1, C-2 and C-3 cargo ships are fundamentally the same, except in horsepower, and consist of two water-tube boilers of either the sectional-header or two-drum types, utilizing air preheaters or economizers, or in other cases both preheaters and economizers, with water-cooled furnaces to give an overall boiler efficiency of 88 per cent at normal load with a feed temperature of 318 degrees F. The forced-draft fans are motor driven, one fan per boiler. The combustion rate is automatically controlled under all conditions of operation. All of the Commission's later plants are equipped with wide-range burners.

The boilers generate steam at 450 pounds per square inch gage pressure and 750 degrees F. total temperature at the superheater outlet, and are equipped with internal desuperheaters to supply the necessary quantity of desuperheated steam for heating purposes. The main feed pumps have been of either the motor-driven reciprocating or the turbine-driven centrifugal types.

The main turbines are of the conventional cross-compound, double-reduction geared type bleeding steam non-automatically for three stages of feed heating. The turbines exhaust to the main condenser, which in all cases is located directly under the turbine exhaust. The steam conditions for which the turbines are designed are 440 pounds per square inch gage pressure and 740 degrees F. total temperature. The astern turbine is located in the exhaust of the low-pressure cylinder and consists of one Curtis wheel to give 80 per cent of normal torque at 50 per cent of the normal ahead revolutions with 100 per cent normal ahead steam flow. The ahead turbines are of either the impulse or the combination impulse-reaction types.

The main thrust bearing is of the segmental type and is located in the gear housing. The tooth loading on the main gear is limited to 60 pounds per inch face per inch pinion pitch-circle diameter. The main turbines and gears are lubricated by a common gravity system, the sump tank being located in the gear case.

Feed heating is accomplished by two closed and one direct-contact deaerating-type heaters to give a feed temperature of 318 degrees F. with zero oxygen by the Winkler method.

The main condenser is of welded construction with cast-iron water boxes of either the two-pass or single-pass design, with a maximum water velocity of 7 feet per second. The main condenser is designed on the basis of 85 per cent clean tubes to give a vacuum of 28½ inches with the circulating water at 75 degrees F.

In selecting pumps, the Commission decided to use motor-driven centrifugals as far as possible, with steam duplex pumps as standbys in some cases. This eliminates a great amount of steam piping, flanges, valves and fittings and also many small inefficient turbines or inefficient duplex steam-driven units.

Two geared auxiliary turbo-generators supply the necessary electric power, with one acting as a standby. The turbines operate on the same steam conditions as the main plant, and exhaust into their own individual condensers at a vacuum of 28½ inches. The condensing system is designed with the same factors as the main plant. Twin two-stage air ejectors mounted on inter and after condensers are used for removing air from both the main and auxiliary condensers, one element acting as a standby. The auxiliary turbo-generators are arranged to exhaust to the atmosphere in an emergency and to facilitate dead ship starting.

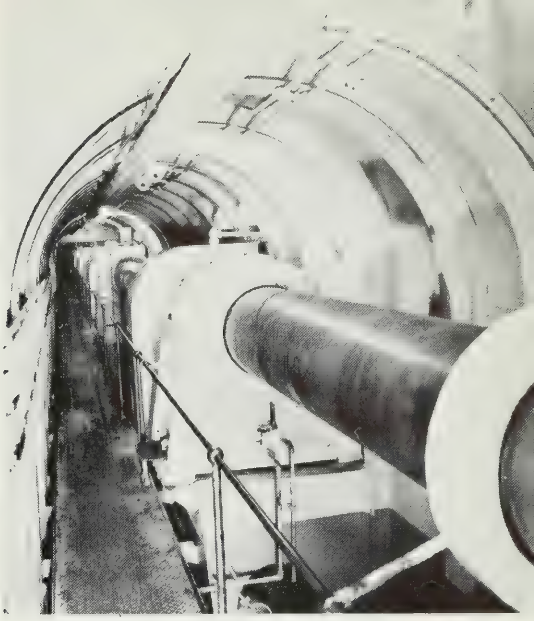
The main generators are of the 3-wire, 240/120-volt design with 25 per cent unbalance.

In the C-1 ships, all motor controls in the engine room are located in a common cubicle, permitting any motor to be started at one point. Additional pushbuttons, however, are located at the motor to permit stopping and starting locally, if desired.

Steam is generated in a contaminated evaporator at 50 pounds per square inch gage for use in the fuel-oil heating system as required.

Make-up feed is supplied by an evaporator which uses steam from the main turbines, with the evaporator supplying heating steam to the first-stage heater and draining into the deaerating heater.

Program



All piping is properly insulated for the temperatures involved, to limit the surface temperature to 125 degrees F.

Motor-driven ventilating fans and adequate ducts insure complete and proper ventilation of the machinery spaces.

The main propeller is of the air-foil-section, variable-pitch type.

The S.S. Challenge was the first steam-propelled ship of the Maritime Commission design to go into service. Her performance established what is believed to be a new world record for a ship of her type and class. Her fuel rate was 0.545 pound per shaft horsepower per hour under trial conditions, which is about 0.575 pound for all purposes.

Diesel Propulsion

The power plants of the motorships of the direct-connected type consist of one 4-cylinder, 2-cycle, directly reversible engine directly connected to the propeller shaft. The engines have a bore of 32 inches, a combined stroke of 95 inches and a piston speed of 728 feet per minute. The pistons and cylinders are cooled with fresh water. Auxiliary power is generated by 275-kilowatt diesel-driven generators.

Both the main and auxiliary engines operate on the same type of fuel, namely, a high grade bunker "C."

To assist atomization and burning, the fuel is heated to approximately 180 degrees F. Chromium-plated liners are also being tried, with the object of reducing liner wear. These engines are operating with jacket-water temperatures slightly higher than normal, namely, 170 degrees F., and arrangements are being made for thermal control. This is found to be quite necessary, particularly at light loads, if the exhaust is to stay clear and the engine is to operate smoothly and handle the heavier fuel.

Fresh water in conjunction with a water softener is used for cooling the engines. The cooling water is sent to a heat exchanger, with sea water as a cooling medium.

Steam for heating is generated by means of a waste-heat boiler, supplemented by an oil-fired section. All other features of the ship are essentially the same as previously described for the steamship.

The first ship of this type to go on trial showed an oil rate of 0.42 pound per shaft horsepower per hour for all purposes.

The other design of motorship developed by the Commission consists of either four or two main engines driving the propeller through reduction gearing, utilizing either hydraulic or electro-magnetic slip couplings. The main engines are of the 2-cycle type operating at approximately 240 revolutions per minute and not exceeding a piston speed of 1110 feet per minute and a brake mean effective pressure of 60 pounds per square inch at normal load. All of the auxiliaries are the same as those installed on the direct-connected diesel motorship.

The Maritime Commission is the first to use electro-magnetic slip couplings for merchant service in this country, and those now in service give evidence that a good selection was made. They not only eliminate torsionals, but permit greater flexibility in maneuvering. The overall efficiency of a coupling is more than 97 per cent.

Deck Machinery

A brief summary of improvements in the design and construction of deck machinery indicates that:

(1) Anchor handling speeds have been increased to an acceptable figure, namely, 30 feet per minute.

(2) The windlass control has been arranged to differentiate between anchor handling and warping without sacrificing protection for the equipment.

(3) Winch and capstan heads have been increased in size and whelps have been eliminated, thus increasing the life of the rope.

(4) Warping capstans have been equipped with an overhauling drive, and the control is similar to that for the warping portion of the windlass, which in effect produces adequate warping power and high light-line speed and limits the maximum line pull to a safe value.

(5) Cargo winch power and speeds have been increased in order to handle satisfactorily a high percentage of 3-and 5-ton loads. Gravity lowering has been eliminated, and the motor control equipment provides for automatic acceleration, both when hoisting and lowering, as well as for dynamic lowering and automatic retardation of overhauling loads.

(6) Waterproof enclosures are being provided for the electric brakes, clutches, etc., used on deck machinery located on the weather deck.

(7) Steering-gear pumps have been improved by the increased use of anti-friction bearings. The universal use of one of the several types of "storage motion" control has practically eliminated control casualties on the electric hydraulic type of steering gear.

(8) The type of davit and lifeboat-handling equipment have been improved with respect to safety, and the power of the winches has been increased so as to hoist the lifeboat and its complement at a higher rate of speed than previously.

Cargo Refrigeration

Cargo refrigeration differs strikingly from the older systems now in use in merchant service. The old system, using brine with its complications, frosting problems and heavy weight, has been replaced by direct-expansion units in each box. Usually, a separate compressor is installed for each box, giving greater flexibility and economical operation under any condition of temperature or type of cargo. Any temperature can be maintained from 0 degree F., permitting the handling of any cargo from frozen products to bananas. Frosting problems have practically been eliminated, as the suction pressure on the compressor is now more nearly equivalent to the temperature desired. For the same reason the compressors are more efficient. Should any box be empty, it is unnecessary to operate its compressor, resulting in additional saving in power consumption.

Pacific Liner Specifications

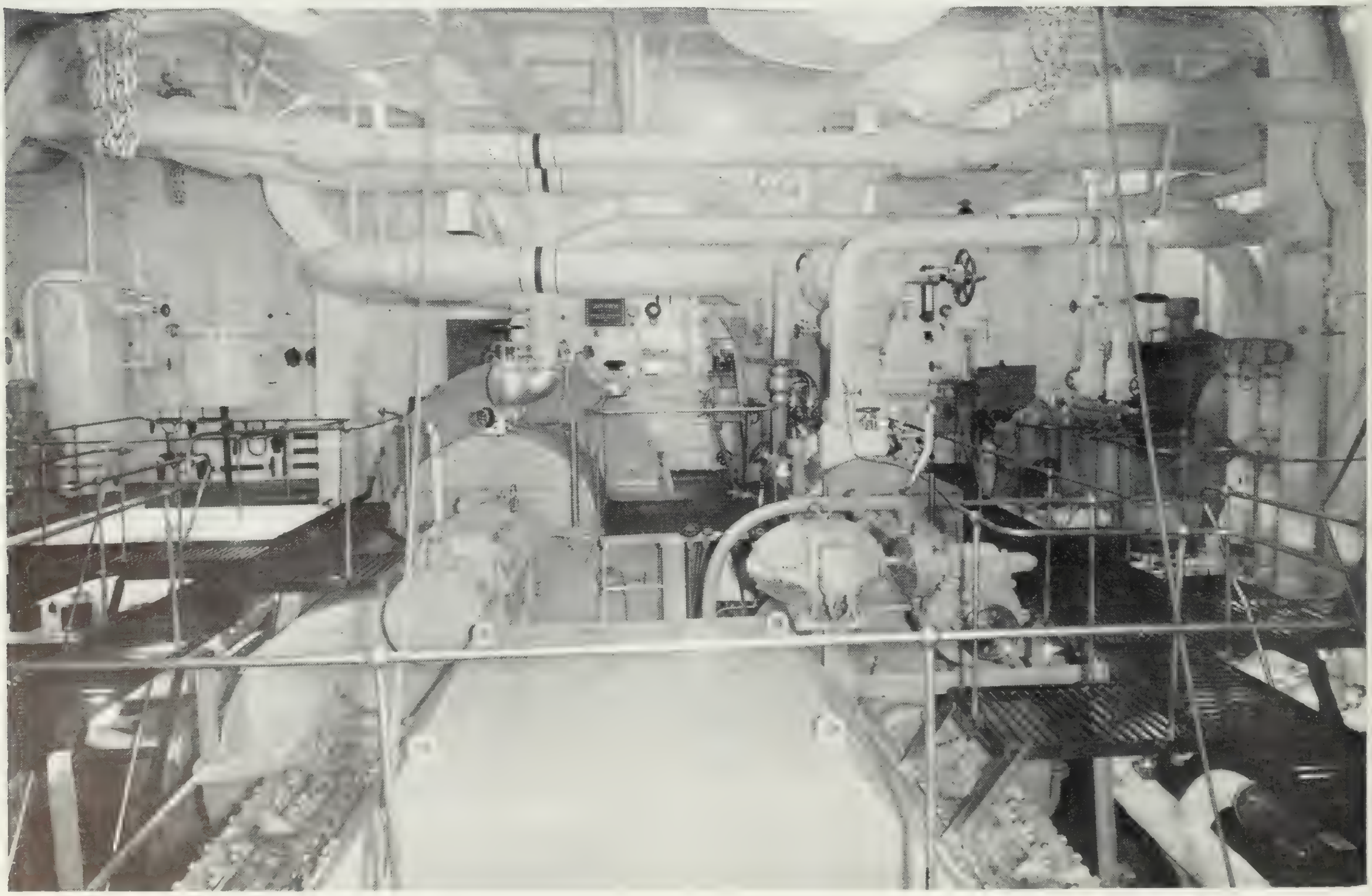
By far the most outstanding engineering achievement thus far is the P-4-P design, which is now in specification form. This ship is to be 760 feet in length, with a beam of 98 feet and a draft of 31 feet 9 inches. It will have a built weight of 23,000 tons and a deadweight of 18,000 tons, giving a total displacement of 41,000 tons. The deadweight will be composed of 8900 tons of fuel oil, 700 tons of fresh water, 1100 tons of cargo oil, 6000 tons of dry cargo, 600 tons of refrigerated cargo and 700 tons of miscellaneous stores.

This large ratio of deadweight to built weight is the result of many factors. First of all, the hull is welded as far as possible and it is so designed that no expansion joints are necessary. There is likewise a great saving in machinery weight, due to the layout as well as to the design. A large evaporating plant removes the necessity of carrying fresh water and, as a result, increases the deadweight 3500 tons, which is exactly the total combined weight of all the main propelling and auxiliary machinery. This great reduction in weight provides an opportunity for a better arrangement of the fuel-oil and ballast tanks, giving added stability with a full three-compartment standard. Since all of the fresh water is made, there is no consequent loss in deadweight from that source and, because of the increased efficiency of the main propelling plant, there is still less loss in deadweight from the burning of fuel, making it possible in this particular design to make the complete voyage without utilizing ballast tanks.

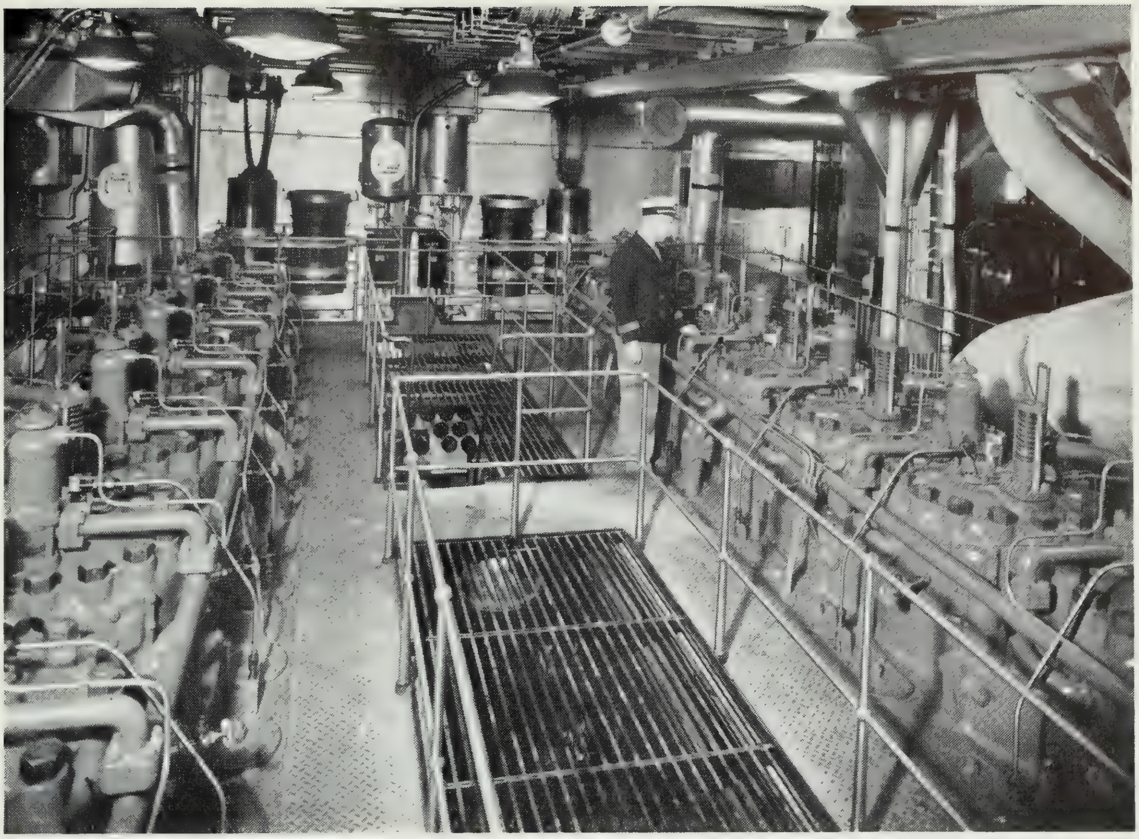
The main propelling machinery as proposed for the P-4-P design is located in two engine rooms, each being a complete and distinct power plant and entirely separate from the other. The machinery in the after engine room will drive the starboard propeller, while the machinery in the forward engine room will drive the port propeller by means of triple-cylinder turbines and double-reduction gears.

The two main engine rooms will be separated by two smaller auxiliary rooms in which will be located the main evaporating plant. This arrangement lends itself readily to safety and stability.

Each main turbine will be designed for a normal output of 29,000 shaft horsepower and a maximum of 44,000 shaft



Typical engine room of C-2 cargo steamer. Single screw driven through double-reduction gears by cross-compound steam turbine



Typical engine room of C-2 cargo motorship. Single screw driven through single reduction gearing and electro-dynamic couplings by two diesel engines

horsepower, operating on a reheat regenerative cycle in contrast to the Rankine cycle, which is now common practice. Steam will leave the superheater outlet at 1200 pounds per square inch gage and 750 degrees F. total temperature. The steam will exhaust from the high-pressure turbine at approximately 300 pounds per square inch gage. It will return to the reheater section of the main steam generator and there be reheated to 750 degrees F. total temperature before entering the intermediate-pressure turbine.

The steam generators will be equipped with economizers and air preheaters, giving an overall efficiency of approximately 88 per cent. The rate of combustion will be controlled automatically, thereby maintaining efficient operation at all loads. Compressed air will be used in place of steam in the soot blowers, thereby eliminating a large amount of steam piping to the soot blowers and at the same time reducing the amount of make-up water to the system.

The main condenser will be of the single-pass design, the circulating water being supplied by scoops and thus eliminating the use of large main circulating pumps. The feedwater will be heated to 400 degrees F. by means of three closed heaters and one deaerating heater.

There will be four 1000-kilowatt turbo-generators operating on steam at 1200 pounds per square inch and 750 degrees F. at the throttle, bleeding at 50 pounds gage non-automatically for heating and automatically at 10 pounds gage pressure for the evaporating plant and deaerating heater. An automatic bleeder was selected for this steam pressure because both the deaerating heater and the evaporator are very sensitive to changes in pressure.

The generators will be 440-volt, 3-phase, 60-cycle machines, and all auxiliaries will be motor driven, with the exception of the main feed pump, which will be turbine driven, exhausting at 10 pounds pressure into the common line between the deaerating heater and evaporator.

All valves in the various piping systems will be remotely operated from the central control station by means of air. Likewise, all controls for vital pumps, watertight doors, fire-screen doors, zone-mechanical ventilation and CO_2 fire-fighting equipment will be located in the central control room, which will be adjacent to the bridge. This permits the operator in the central control station to have complete control of the ship in any type of emergency, whether it be fire, collision or grounding. This installation is a distinctly progressive step; it results not only in better and safer operation, but in a reduction of piping weight.

The main steam piping will be led direct from its own boiler to a common manifold incorporated in the maneuvering valve of the main turbine, thereby eliminating certain flanges and connections which otherwise would be required, if they were joined in a common header. This, likewise, permits the use of smaller piping, giving greater flexibility to imposed stresses due to temperature. Because of the higher pressure and piping arrangement, it is not contemplated using any piping larger than 6 inches in diameter.

The reheat cycle has been adopted for a dual purpose. First, it reduces the fuel consumption approximately 15 per cent below that which would be obtained if a Rankine cycle were used, both having the same limiting temperature. Second, it gives control over the moisture content in the exhaust, thereby giving a flatter fuel per shaft horsepower curve. In other words, approximately the same economy is obtained at half power, normal power and full power.

By limiting the temperature to 750 degrees F., carbon steel may be used throughout, reducing the plant cost materially.

With such a plant, it is expected that an oil rate of 0.50 pound per shaft horsepower per hour for all purposes will be obtained. This includes the hotel load and the making of 64,000 gallons of fresh water per day. The rate of the President Coolidge is 0.72 pound per shaft horsepower per hour, and the calculated rate of the America is 0.634 pound. Both of these vessels carry fresh water.

Lighting on the P-4-P will be completely fluorescent. This type of lighting is particularly suitable for marine work in that it is far more efficient than Mazda lighting and at the same time gives longer life and a more artistic lighting effect. While the first installation costs more than Mazda, there is a considerable saving in the generator capacity because of the reduction in the lighting load and at the same time a considerable reduction in the air-conditioning load, which in the case of the P-4-P design amounts to 17 tons.

The most modern type of air-conditioning will be employed, each cabin and tourist-class stateroom being supplied with one or more units which will supply heating in the winter and cooling and dehumidification in the summer. Each unit will be complete with coils for chilled or hot water, centrifugal recirculating fan, air filter, drain pan and controls. Heating and cooling will be regulated primarily by thermostats which control the water flow through the coils. In addition, fan adjustment will be provided so that the volume of circulated air may be reduced for winter operation, or to suit individual desires. Hot or chilled water from the refrigerating machinery room will be supplied to the units. The units will be designed for recirculation in order to provide adequate ventilation and comfortable air movement, particularly during the summer months. About 30 to 50 cubic feet per minute per person, or 20 per cent of the total volume handled, will be outside air. The capacity of the units will be sufficient to effect a drop of 10 degrees F. in the room temperature with a relative humidity within the comfort zone. Such a system is neat in appearance and flexible enough in operation to satisfy individual demands, and it is reliable and economical.

The main propellers will have variable pitch with an airfoil blade section. They will be constructed of solid manganese bronze and statically balanced. These propellers will be the largest ever manufactured in this country, and will offer quite a casting problem, requiring approximately fourteen days to cool.

Not only will the P-4-P ship be an efficient passenger liner during times of peace, but she will, likewise, be suitable for quick conversion for use as an aircraft carrier. The smokestacks are located on the side of the ship to simplify conversion during a national emergency.

Experimental High-Pressure Cargo Ship

The Commission's cargo ships must be capable of maintaining high sustained sea speed, but, as the power increases, it must have increased economy. To obtain first-hand information, the Commission is building a ship of 8000 shaft horsepower, having a main power plant utilizing the same fundamental design as that on the P-4-P. From a cost, weight and performance standpoint, studies indicate that such a plant is practical at 8000 shaft horsepower, becomes justified at approximately 10,000 shaft horsepower and is noticeably more economical at 15,000 shaft horsepower and above. This is the first installation using reheat.

In detail, the design of the experimental ship will be as follows: Two steam generators will each supply 32,000 pounds of superheated steam per hour for normal operation and about 35,200 pounds per hour for maximum operation, at 1235 pounds per square inch gage pressure and 750 degrees F. at the superheater outlet. Approximately 26,500 pounds per hour of exhaust steam at 240 pounds gage from the high-pressure turbine will be reheated to 750 degrees F. in each unit.

Each steam generator will be of the double-casing, single-uptake, three-drum A-type with an air heater, economizer and convection superheater and reheater. A desuperheater with a capacity of 3000 pounds per hour is to be provided in the steam drum to supply steam for the auxiliaries. Water walls are to be provided for the reheater section. In order to assure good circulation, external downcomers will be provided, all of the tubes inside of the boiler casing being upcomers. Two burners of the wide-range type will be provided for the main section, and two additional burners will provide separate firing for the reheater section.

Since the hot gases from the reheater section will sweep across the boiler through both sections of tubes, it is necessary to arrange the superheater surface so as to prevent excessive steam temperatures while maneuvering or backing, when the reheater section is shut down. This is done by placing a primary superheater in the tube section on the reheater side of the unit and by placing a secondary superheater in the other section of tubes on the uptake side of the casing. The reheater section will be located below the primary superheater in the same section of tubes.

In order to eliminate solids in the steam, which might be damaging to the turbine blading, a special baffle separator is to be placed in the steam drum, which is guaranteed to prevent a carry-over in excess of two parts per million of suspended solids (as determined by test) when the water has 50 grains of total solids (chlorine maximum of 30 and pH value of 10) and the water level in the drum is 3 inches above normal.

Automatic combustion control will be provided. The system is to be actuated through master controls which control the oil and air supply (dampers) simultaneously and by secondary controls which will actuate the air dampers to adjust the fuel-air ratio, if the action of the master controls disturbs the correct ratio. For the high-pressure steam, the regulation will emanate from the steam pressure at the superheater outlet, while the reheater regulation will be actuated by the steam temperature at the reheater outlet. Manual control will also be provided for the boilers. This will be designed so as not to interfere with the adjustment of the automatic control system. To protect the reheater section, an automatic safety shut-off control will be arranged to stop the flow of oil to the reheat burners when the flow of steam falls below a predetermined rate. This shut-off control will have a manually operated trip and reset lever. Whenever the reheater burners are shut down it will be necessary to reset the solenoid control valve manually before bringing the burners back into service.

Forced draft will be supplied by two blowers—one for each boiler. The blowers are to be cross connected so that in an emergency one blower can handle both boilers at reduced load. The static pressure will be about 7 inches of water for normal operation and 12½ inches for maximum operation. To maintain efficient operation, electric smoke indicators and soot blowers of the air-puff type (as previously mentioned) will be furnished. An efficiency of 87 per cent is guaranteed for the boilers, but there is every indication from experience in land practice and from the estimates that this figure will be easily exceeded.

The main turbines are of the double-reduction, three-cylinder type, with the reversing turbine incorporated in the low-pressure casing. For normal operation the high-pressure turbine will take steam at the throttle at about 1200 pounds per square inch gage and 740 degrees F. and exhaust at about 260 pounds absolute to the reheater; the intermediate-pressure turbine will be supplied with steam at 230 pounds absolute and 740 degrees F. at the inlet and will exhaust at 40 pounds absolute, and the single-flow low-pressure turbine will expand the steam from about 37.5 pounds absolute to about 28½ inches of vacuum. The astern turbine will operate at the full 1200-pound gage pressure and 740 degrees F. total temperature.

The high-pressure turbine will be of the impulse type with five stages; the impulse-reaction intermediate-pressure turbine will have a single impulse stage followed by twenty rows of reaction blading, and the single-flow reaction low-pressure turbine will have sixteen rows of blading.

For emergency operations the low-pressure turbine can be operated alone, or, if the low-pressure turbine is damaged, the high-pressure and intermediate-pressure cylinders can operate as a compound unit with the exhaust going to the main condenser. When going astern, the astern turbine will develop about 80 per cent of the normal ahead torque at about 50 per cent of the normal revolutions per minute while being supplied with 100 per cent normal ahead steam.

To allow for expansion when the turbines are heated up and cooled off, they will be supported at the forward end by a flexible web and will be bolted directly to the gear case at the after end.

Extraction or bleeding will be provided at five points in the turbines for the various auxiliaries—at the high-pressure exhaust for the fourth-stage feed heater; at the intermediate pressure inlet for the generator turbines; at 115 pounds absolute for the evaporator and third-stage feed heater; at the low-pressure inlet for the second-stage (direct-contact deaerating heater) feed heater; and at 9 pounds absolute for the first-stage feed heater.

The turbines will drive the propeller shaft through a double-reduction double-helical gear unit having an integral thrust bearing of the pivoted segmental shoe type mounted at the forward end of the gear casing, and with a motor-driven turning gear mounted on an extension of the high-pressure turbine pinion shaft. The high-pressure and intermediate pressure pinions will drive a common first-reduction gear, and the low-pressure pinion an independent first-reduction gear. Both of the first-reduction gears will be placed forward of the main or slow-speed gear. The low-speed pinions will be driven through quill shafts. For normal operation the various shaft speeds will be as follows: High-pressure turbine, 8910 revolutions per minute; intermediate-pressure turbine, 5000 revolutions per minute; low-pressure turbine, 4200 revolutions per minute; and the low-speed gear, 96 revolutions per minute. Forced lubrication will be supplied to the gears with spray nozzles fitted for the ahead and astern faces of the high-pressure, high- and low-speed pinions. A single-pass condenser will be located athwartship under the low-pressure turbine casing and bolted directly to the casing exhaust flange. The condenser will have approximately 6000 square feet of cooling surface. It will be equipped with the usual twin two-stage ejector, and will be arranged to handle exhaust from the high-pressure and intermediate-pressure turbines, if the low-pressure turbine should be disabled for any reason.

The condensate will be pumped from the condenser by the condensate pump and go through a combined main air ejector inter and after cooler, gland exhauster condenser, drain cooler and first-stage heater; and then to the direct-contact deaerating (second-stage) heater. At this point the system will be completely deaerated. The usual specifications call for a maximum of 0.03 cubic centimeter of free oxygen per liter. The feed pump will take suction from the deaerating heater and deliver the feed to the boiler via the third- and fourth-stage heaters and economizers.

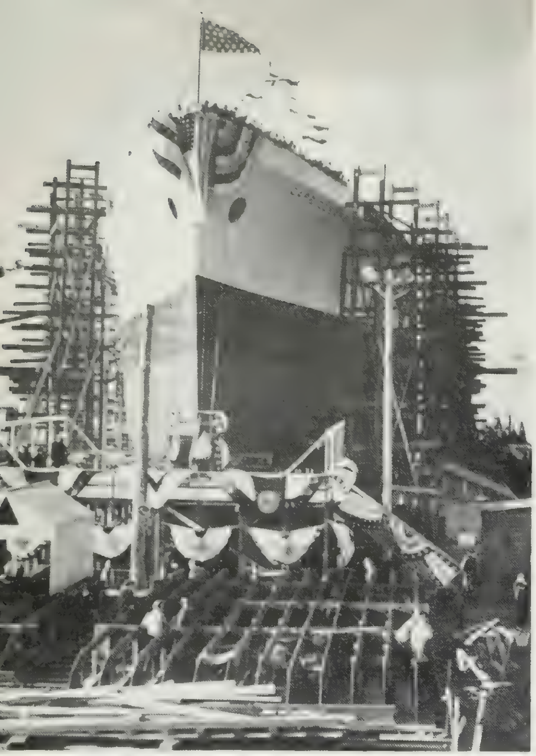
Three feed pumps will be used. Two of these pumps will be geared, motor-driven, variable-stroke, inverted triplex pumps. Each of these pumps will have sufficient capacity to serve one boiler. In addition, and as a standby, there will be a turbine-driven centrifugal feed pump with sufficient capacity to feed both boilers. The deaerating heater will be maintained at 10 pounds gage pressure by means of a regulating valve on the steam supply.

This electrical load will be carried by two 350-kilowatt, 240/120-volt, three-wire, 1200 revolutions per minute generators.

There are some disadvantages for a power plant such as has been described in the foregoing, but the advantages certainly outweigh them. The major disadvantage is in the run of reheat piping and the addition of a reheat section to the boilers, but these difficulties are minimized by a compact machinery arrangement which places the boilers in the same compartment and just forward of the turbines. This results in very short runs of piping. Since the temperature has been kept down to 750 degrees F., it is not necessary to use special alloy steel piping, so that ordinary carbon steel will be used, as is customary for power plants using steam at 450 pounds gage. The use of the 1200-pound pressure will mean that the piping will have to be thicker but much lighter, because of the smaller sizes. On a ship of the same power and using 450-pound steam, the high-pressure steam main would be approximately 6 inches in diameter, while for this 1200-pound plant the size will be approximately 3 inches. It is easy to see that in a plant like this, where the piping is small and short in length, and where all units are compact and close together, there is a considerable saving not only in weight but in lagging, heat, and consequently in engine-room ventilation.

For this power plant the closed turbine water rate will be approximately 5.70 pounds per shaft horsepower per hour for normal operation. It is anticipated that a fuel rate of 0.50 pound per shaft horsepower per hour for all purposes will be obtained. By comparison, this plant, operating at 1200 pounds gage and 750 degrees F., is practically equivalent to a plant operating at 1200 pounds gage and 900 degrees F. without the reheat cycle.

(Abstract of a paper read before the annual meeting of the Society of Naval Architects and Marine Engineers, November 14, 1940.)



Shipbuilding From Puget Sound To

A Billion-Dollar

Ready for launching at Tacoma, Washington

●

One hull coming off the ways and two at the outfitting dock, Tacoma yard of Seattle-Tacoma Shipbuilding Corp.

●

Southern California

Construction Program
s Sliding
off the Ways

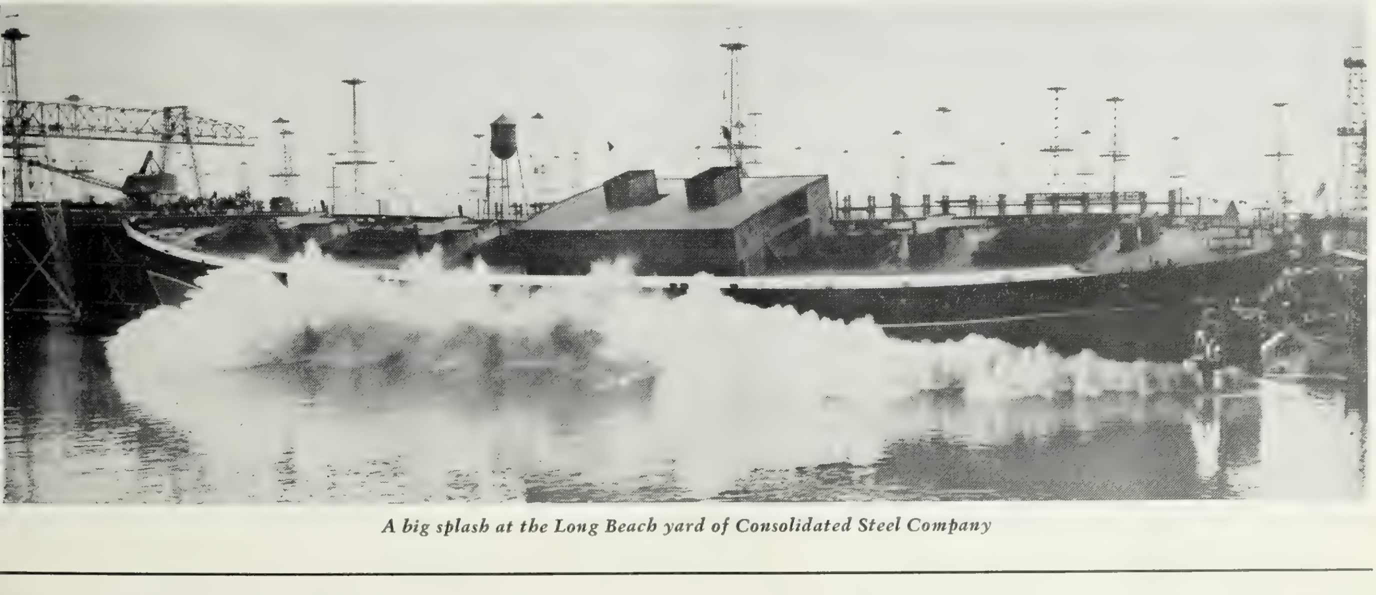
Going over at Long Beach, California

At the moment, the total naval and merchant shipbuilding program under contract with or allotted to Pacific Coast shipyards is growing very rapidly, and has passed the billion-dollar mark.

This program is spread over the whole Coast from Puget Sound to San Diego, and in its ramifications touches practically every industry in Washington, Oregon and California, as well as some industries in virtually every state of the Union.

The table published herewith shows the details of this program, most of which, of course, is still on order. However, the great bulk of it will be in construction during 1941.

Starting in the northwest corner of the United States, at the Port of Seattle, we will take the reader on a brief pictorial and textual survey of the shipbuilding effort to show how the shipbuilders of the Pacific slope are meeting the challenging problems involved in preparing to construct this tremendous volume of new tonnage—problems suddenly thrust upon them after nearly two decades during which the shipyards of this region have had very little new construction and have had to depend almost exclusively on repairs, on general industrial and engineering work, and/or on structural steel fabrication.



A big splash at the Long Beach yard of Consolidated Steel Company

Shipbuilding

ON THE PACIFIC COAST

Work Under Contract or Allocated as of January 1, 1941

Puget Sound District

SEATTLE-TACOMA SHIPBUILDING CORP.

Tacoma Yard

5 C-1 motorships	$10,635,000
4 C-3 steamers	11,960,000
2 C-3 steamers	5,980,000
2 P-4 steamers (?)*	47,430,000

Seattle Yard

25 destroyers	$172,000,000
New yard	5,000,000

LAKE WASHINGTON SHIPYARDS

4 A. S. N. T.	$1,916,000
1 Survey ship	1,279,000
4000 floats	1,800,000
6 seaplane tenders	27,060,000

ASSOCIATED SHIPBUILDERS, SEATTLE

4 seaplane tenders	$18,181,996
1 conversion	1,420,000
Lighters	400,000
Yard	700,000

PUGET SOUND NAVY YARD

10 destroyers	$70,000,000
1 sub tender	16,600,000
Auxiliary vessels	18,000,000
Docks and pier	10,000,000

TODD-SEATTLE DRY DOCKS

Conversion jobs	$2,500,000

PUGET SOUND TOTAL...... $422,861,996

Columbia River

COMMERCIAL IRON WORKS

4 net tenders	$1,958,556

WILLAMETTE IRON & STEEL CO.

2 conversions	$2,840,000
2 mine layers	4,000,000
Yard	1,000,000

COLUMBIA RIVER TOTAL... $9,798,556

San Francisco Bay

BETHLEHEM UNION PLANT

5 C-1 steamers	$10,000,000
27 destroyers	200,000,000
4 cruisers	120,000,000
Yard	10,013,000

MOORE DRY DOCK CO.

4 C-3s	$11,221,520
3 C-2s	8,550,000
2 sub tenders	24,000,000
5 rescue vessels	10,000,000
Lighters and caissons	2,000,000

WESTERN PIPE AND STEEL CO.

5 C-1 motorships	$10,635,000
4 C-3 steamers	11,960,000
Life floats	1,000,000

GENERAL ENGINEERING & DRY DOCK CO.

4 Net tenders	$2,036,000
4 mine sweepers	6,720,000

MARE ISLAND NAVY YARD

8 submarines	$48,000,000
2 sub tenders	24,000,000
2 sub tenders	33,333,000
Auxiliary craft	2,000,000

TODD-CALIFORNIA SHIPBUILDING CORP.

30 cargo vessels	$50,000,000
Yard	2,000,000

PACIFIC BRIDGE CO.

1 drydock	$1,649,000

PACIFIC DRY DOCK AND REPAIR

Lighters	$284,572

BASALT ROCK CO.

8 lighters	$264,000

SAN FRANCISCO BAY TOTAL $589,666,092

Los Angeles District

CONSOLIDATED STEEL CORPORATION

4 C-1 steamers	$7,560,000
32 lighters	1,000,000

BETHLEHEM SAN PEDRO YARD

10 destroyers	$81,000,000
Yard	4,000,000

LOS ANGELES SHIPBUILDING & DRY DOCK CO.

3 repair vessels	$39,000,000
Yard	950,000

LOS ANGELES TOTAL....... $133,510,000

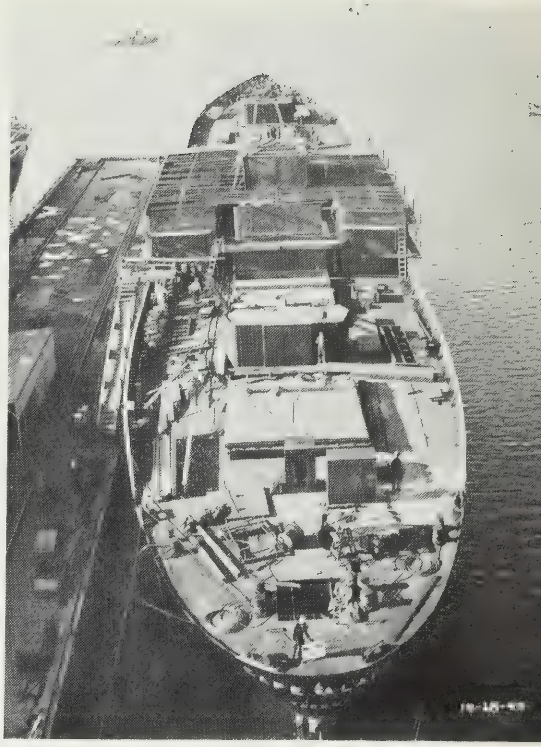
PACIFIC COAST TOTAL.....$1,155,836,644

Note: Several of the cost figures given here are estimates from various sources.

* This item represents the only bid received by the Maritime Commission on these vessels. The Commission is trying to arrange a contract, the terms of which will be agreeable to all four parties—the shipbuilder, the prospective operator, the U. S. Navy and the Commission.

During these two decades, the technique of shipbuilding operations had been radically changed in a number of important elements. The most important of these is the method of fastening the ship together. Here welding has taken the place of riveting to a very large extent. This change is responsible for: a completely different basis in the arrangement of the various elements that go to make up a shipyard; somewhat different requirements as to machinery required; and very different requirements as to the training of the necessary personnel.

Most of the shipyards on the Pacific Coast who are involved in this shipbuilding program were faced with the building of a new yard complete or of rebuilding their ways in a busy repair yard. This required raising additional capital. Under Maritime Commission or naval contract conditions, very heavy bonds are required and a showing of considerable working capital. These three financial considerations have combined to make it very difficult for some of the shipbuilders to undertake large naval and/or mercantile contracts. These difficulties are gradually being adjusted, and as we enter 1941, the Pacific Coast shipbuilding industry has already started actual construction on the big National Defense Program.



C-1 cargo vessel outfitting dock, Tacoma

Shipbuilding on Puget Sound

A SURVEY OF THE PRINCIPAL YARDS

When the Maritime Commission build-ng program started to come West in the ate fall of 1938, there was no shipyard on Puget Sound ready to take advantage of he opportunity. Todd-Seattle Dry Docks ad no shipbuilding ways nor any space n which to build ways. The Todd Ship-uilding Corporation owned the site of heir former shipyard at Tacoma, but the te was practically bare ground.

Several other former shipbuilding sites t Seattle were more or less available. The Lake Washington Shipbuilding Co. t Houghton had a well-equipped yard, ut no ways or shops adequate to build a rge merchant vessel.

Seattle-Tacoma Shipbuilding Corp.

Under these conditions, a new ship-uilding firm was established, with the ame Seattle-Tacoma Shipbuilding Cor-oration.

This corporation secured a contract om the Maritime Commission to build ve C-1 motorships, and in three months ansformed the old site of Todd's Ta-oma plant from bare land to a modern ip erection yard.

This yard is the first of its type to be uilt on the Pacific Coast. Its site consists seventy acres of dry, flat lands, and bout an equal area of hard bottom tide nds. At the edge of the tide land the ater drops suddenly to a 300-foot depth nd presents a mile and a half width of pen deep water.

The general layout of this yard is shown in the illustration made from an aerial photograph. Two 500-foot shipbuilding ways were built, with three wide craneways. At the inshore end of ways, approximately 100 feet of open space was left for outdoor welding racks for large fabrication assemblies. Inshore of this space is a large plate shop 80 feet by 360 feet, with an extension 150 feet by 200 feet on its inshore side. The cranes in this extension run out over the 160 feet by 150 feet open space which corners into the building and is used for open plate racks. This shop covers a ground area of nearly an acre and a half. It is adequately served by electric overhead cranes. Three Clyde 40-ton Whirley cranes mounted on high portal type traveling towers operate on the craneways serving the building ways, and cover the open fabrication yard at the head of the ways.

In line with the plate shop, and at its left (see illustration), is a building 130 feet by 260 feet with a curved roof supported by a Summer-Bell timber truss on a clear span of 130 feet to give an unobstructed mold loft floor over the entire area of the building. The ground floor of this building houses a series of shops, storerooms and locker rooms. The shops include: pipe shop equipped with cutting, threading and bending machines; sheet metal shop equipped with shears, cutters, punches, bending brake, and other machines; a joiner shop with saws, jointers and planers; a machine shop with some small tools. All heavy machine work is contracted with local shops prepared to undertake such work.

At the left hand of the building ways is the outfitting dock, which at the time this photograph was made had just been completed. Note that a few feet of floor at outshore end is still to be laid. At left of inshore end of this dock will be seen the frame of an unfinished building. This is a warehouse in which equipment is stored while awaiting installation in the ship. All of the buildings are of heavy timber frame construction covered with corrugated galvanized sheet steel.

The Tacoma plant of the Seattle-Tacoma Shipbuilding Corporation has at this writing four C-1 motorships in the water, and is to deliver the first of these during January, 1941. The plant is working with great smoothness and efficiency under the competent management of Walter L. Green, vice president of the corporation and general manager of this plant, and with the able assistance of Charles D. Gillet, chief engineer, who heads the staff of young enthusiastic technicians that is responsible for production, detail design and installation layout for machinery and equipment.

The morale in this yard is excellent. One unique custom has been introduced here which the management thinks has lifted the morale considerably. All workers are wearing metal helmets for safety reasons. These helmets are painted, and the color of the paint denotes the craft of the wearer. This innovation has introduced a gay color note into the usual drabness of shipyard vistas, and seems to have a good phychological effect on the personnel.

This Tacoma yard has before the Commission the only bid submitted for two P-4 steamers for the American President Lines' transpacific service. These two ships, if and when built, will be the largest commercial vessels ever delivered from an American yard. The bid of the Tacoma yard is being very seriously considered by the Maritime Commission, and they are trying to work out a contract the terms of which will be agreeable to all four parties concerned, viz., the shipyard, the Commission, the U. S. Navy and the operators. The yard has ample area for the expansion necessary to build these two and many more large vessels.

The Seattle-Tacoma Shipbuilding Corporation has a contract with the U. S. Navy which calls for twenty-five torpedo boat destroyers at an estimated cost of approximately $172,000,000.

A new shipyard located on Harbor Island, Seattle, is being prepared to build these naval vessels. Five 400-feet-long shipbuilding ways is the present plan, with ample room for any necessary expansion. The buildings being erected include: a welding assembly bay 90 feet by 470 feet; a fabricating shop 275 feet by 152 feet; a plate shop 60 feet by 275 feet, with an open craneway extending 225 feet at one end and 300 feet at the other; a machine shop 150 feet by 175 feet; a storage warehouse 260 feet by 150 feet; a large paint shop; a mold loft 260 feet by 130 feet; a restaurant and hospital; and a large administration building. Present plans call for an expenditure of approximately $5,000,000. All buildings are of heavy wood frame construction, and will be sheathed with corrugated galvanized steel.

Although this yard-building project has been somewhat delayed because of labor troubles in the lumber mills, the contractors are still confident that the yard will be ready to lay the first keel during February, 1941.

Seven large Whirley type cranes, mounted on portal type traveling towers, are now being built for this yard at the Seattle shops of the Washington Iron Works.

Lake Washington Shipyards

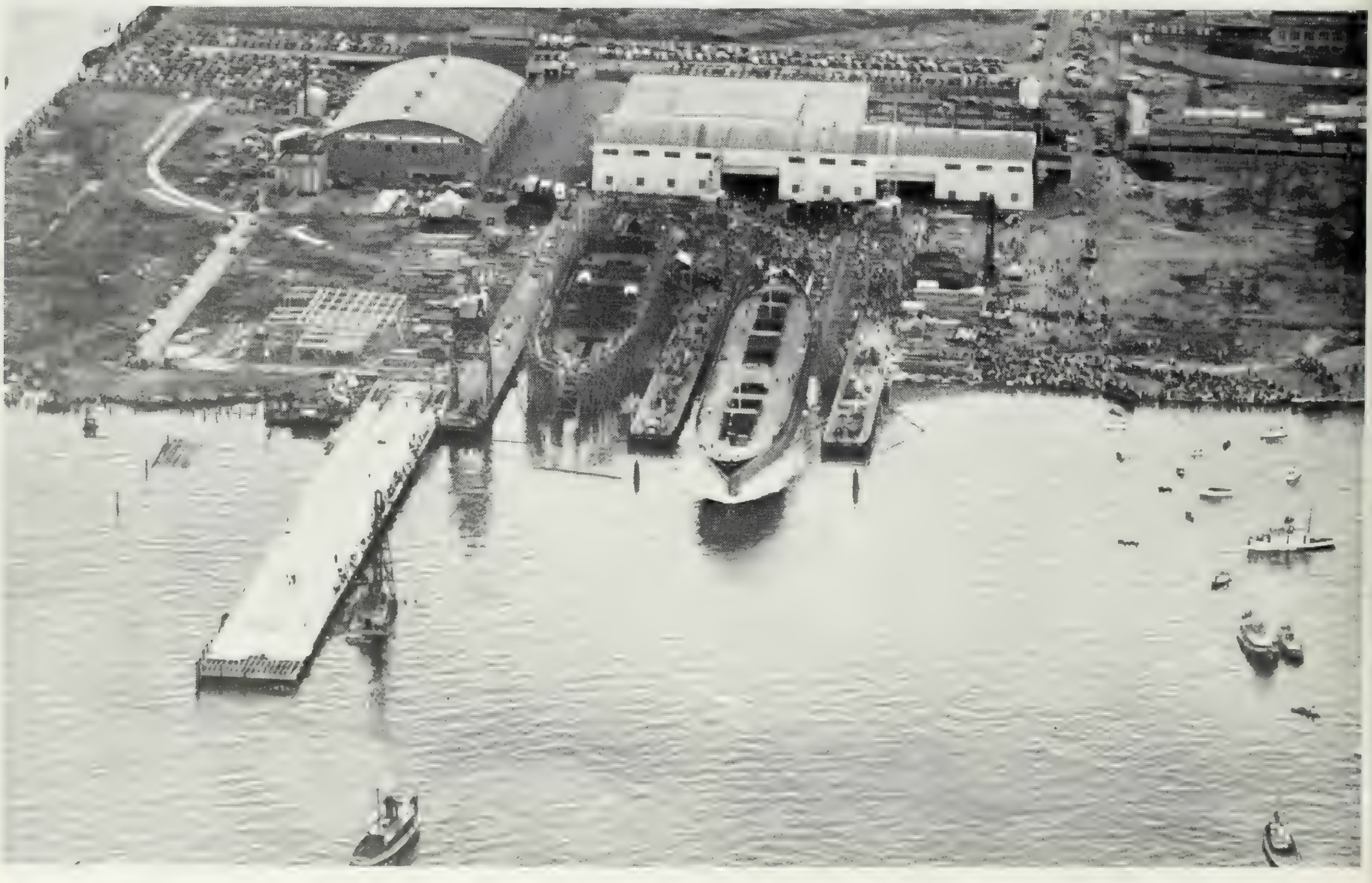
This well-equipped, compact yard, located at Houghton on the east shore of Lake Washington, has in the past gained the confidence of more than one branch of the Federal Government by turning out excellent ships. A notable and recent example is the Coast and Geodetic super survey vessel Explorer. This confidence has resulted in a nice lot of orders from Washington, as shown in the list herewith. The combined value of these orders is approximately $33,000,000.

Of these orders, they have under construction: two anti-submarine net tenders, the first of which is to be launched in February, 1941; a number of special barges, several of which have been delivered; and many baulk tanks for anti-submarine nets.

The first expects to start immediately on a program of yard expansion to take care of the seaplane tenders.

Associated Shipbuilders

Two pioneer Seattle firms joined their resources recently to form the Associated



Bird's-eye view of the Tacoma yard of the Seattle-Tacoma Shipbuilding Corporation on the occasion of their first launching

Shipbuilders. These firms are the Lake Union Dry Dock and Machine Co. and the Puget Sound Bridge and Dredging Co. The former concern operates a ship repair and building yard on Lake Union, Seattle. The Puget Sound Dredging Co. has a large plant on Harbor Island, where it has fabricated steel for large bridges and buildings, built many barges, and has a large graving dock in which were built the big pontoons for the floating highway bridge across Lake Washington.

Associated Shipbuilders have secured a contract from the U. S. Navy for four seaplane tenders at a total cost of $18,181,996, and will immediately build a shipyard on their Harbor Island site. They have purchased the equipment of the Commercial Boiler Works, Seattle, and have moved it to Harbor Island, where it will be installed as soon as foundations are ready.

Puget Sound Navy Yard

The Navy Yard at Bremerton is very busily engaged on an expansion program including a $2,000,000 outfitting pier and two drydocks costing nearly $8,000,000. At the same time, work is going ahead rapidly on naval construction.

On the ways and at the outfitting dock are five tenders, one destroyer and a seaplane wrecking derrick. Allotted are ten torpedo boat destroyers and four seaplane wrecking derricks. The total work under construction and allotted at Bremerton will run close to $100,000,000.

Summary, Puget Sound

Summing up the totals of merchant and National Defense shipbuilding for any definite time or district is a rather useless piece of labor these days, because the allotments and contracts are changing so rapidly that a correct statement at time of preparation may be far from correct when it appears in printed magazine form for our readers. However, the Puget Sound shipbuilding on order or under construction at the present writing (December 27, 1940) appears to be 73 ships, with a total cost of $391,156,000, plus conversion contracts totaling some $6,000,000, plus new shipyard and yard expansion expenditures of approximately $20,000,000—or a total shipbuilding expenditure of $417,000,000. This work at present is employing approximately 15,000 men, and this employment figure will be increasing rapidly in the near future.

Certain changes and additions made since this article was compiled have raised this figure to that shown in the table, page 60.

The Coast & Geodetic Survey steamer Explorer, delivered early in 1940 by Lake Washington Shipyards

Shipbuilding in Portland Area

At present, two firms in Portland, Oregon, are busily engaged in the steel shipbuilding business under the National Defense Program. There is much interest, however, on the part of other firms, and considerable study is being made by local banks and public bodies with the idea of attracting more of this shipbuilding effort to Columbia River district.

Considering the large number of vessels turned out from this district in the Shipping Board days, it would seem that the Columbia River shipbuilders are just getting started. The two firms now actively in the program are the Commercial Iron Works and the Willamette Iron and Steel Company.

Both of these firms have large shops well equipped for general engineering work, and particularly for serving the lumber industry. Both during the Shipping Board shipbuilding boom made large quantities of marine machinery, including boilers, reciprocating steam engines and numerous auxiliaries. The equipment then used is still on hand or has been replaced with more efficient machines.

In addition to their shops, the Commercial Iron Works have always maintained a small shipyard. This yard has now been enlarged and equipped to handle on (two) covered ways the construction of steel vessels up to 350 feet in length. The erection over one of the ways is extended inshore to serve a covered welding assembly rack, and this rack and the ways are served by five 20-ton electric overhead traveling cranes.

Here the firm is building four antisubmarine net tenders. Much of the fabrication for all four of these hulls is finished, and two hulls are partially erected. Under the supervision of Joseph Grebe, marine superintendent, the work goes forward smoothly, and the first hull will soon be ready for launching.

An interesting method of jacking up light plates for welding to stiffeners was observed here. An electric lifting magnet fitted with a steel hasp was placed on the plate, and a specially-designed steel bar fulcrumed on the stiffener lifted the magnet and the plate to contact, where it was fixed by spot welding ready for the permanent weld.

Willamette Iron and Steel Company shops are on the river bank. The firm has a contract for the conversion of 2 passenger and cargo steamers to Navy transports, and has very recently been allotted two mine sweepers to build. Like all of the firms engaged in National Defense work, Willamette is very shy of publicity, and rightly so. However, it is known: that the firm owns a tract of land alongside of its present plant; that this tract is being vacated of all tenants; and that some extensive expansion of the plant is being planned. Portland rumor sees a large shipbuilding plant planned for this site.

Summarizing: Portland district has six ships to build, with a total value of approximately $4,000,000, and is prepared for many future allotments.

As this page is being released to the printer, announcement is made in the press that the Navy Department has contracted with Willamette Iron & Steel Company to build two or more mine layers at an estimated cost of $2,000,000 each, and has allotted $1,000,000 to that firm for yard expansion.

Shipbuilding On San Francisco Bay

Since San Francisco Bay was the pioneer steel shipbuilding district, and always has been in normal times the shipbuilding center of the Pacific Coast, it is only natural that it should now benefit most largely from the new shipbuilding boom. Here we find five yards busy on major ship items of the National Defense Program, two new large shipbuilding yards being developed, several smaller shipyards working on auxiliary craft, and many rumors of other shipyard projects in *futuram esse*.

It is hard to decide where to start with such a wealth of material, and with no editorial board of priorities to help us make a decision, so we will give the precedence to age, which brings us first to the great U. S. Navy Yard at Mare Island, which was founded before the Civil War and has had a fairly constant development as a shipbuilding and ship repair depot for nearly ninety years.

Mare Island Navy Yard

Today Mare Island has modern equipment adequate for the building, maintenance and repair of all classes of naval vessels, and with the graving dock plant at Hunters Point (recently purchased by the U. S. Navy but still under operation by the Union Plant of Bethlehem Steel) this Navy yard will be equipped to drydock the largest naval ships.

The program of ship construction at the Navy yard includes eight submarines, four submarine tenders and several auxiliary craft. The total cost is estimated approximately at $100,000,000. There are said to be 15,000 men working in the plant, and a number of the shops are operating on a three-shift basis. A large volume of reconditioning and repair work is in process along with the new work, and it is probably true that today Mare Island is the busiest shipyard on the Pacific Coast.

The technical staff, both in the commissioned and the civil service branches, has been maintained at a high level, and although now fairly swamped with the detail demands of the large program, this staff is making good headway and the work is progressing in an orderly fashion and as rapidly as could be expected.

Mare Island expects to have over 20,000 men working before the end of 1941.

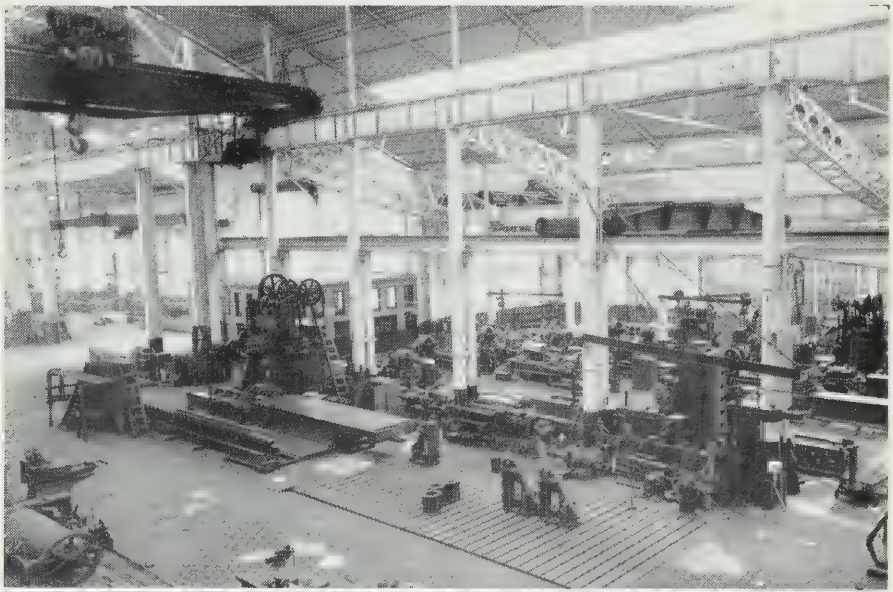
Union Plant—Bethlehem

The second shipbuilding plant on San Francisco Bay in point of age is the Potrero Works of the Union Plant of the Shipbuilding Division of Bethlehem Steel Co. (the old Union Iron Works), which was founded in 1881, and for nearly twenty years thereafter was the only commercial steel shipbuilding plant on the Pacific Coast. The long record of this plant in shipbuilding and engineering achievements is so well known that we need only say that for quality in their class and size, Union Iron Works ships, both naval and merchant, have very consistently led the nation. The apprentice ship system carried on by this plant in the first thirty years of its history gave the Pacific Coast most of its experts in the shipbuilding trades, and many of its industrial and engineering executives. It has been in a very true sense "the cradle of Pacific Coast shipbuilding."

About three years back, Bethlehem Steel Co. finished a $2,000,000 modernization program which transformed the Union Iron Works into a thoroughly up-to-date plant for shipbuilding and ship repair work.

Plate yard and crane plate shop and inshore end of building ways, Bethlehem's San Francisco yard

Bird's-eye view of the San Francisco yard of Bethlehem Steel Co., Shipbuilding Division



Two general views of the machine shop at the San Francisco Works of the Union Plant of the Bethlehem Steel Company, Shipbuilding Division

Today this yard is busy building five C-1 cargo steamers for the U. S. Maritime Commission, and has on order 27 torpedo boat destroyers and 4 cruisers for the U. S. Navy; in all, 32 ships, with a total cost of approximately $330,000,000. In order to allow room for expansion, the U. S. Navy has purchased a level waterfront tract on the east side of the present plant and has allotted $10,000,000 for the building of a complete shipyard there to be devoted exclusively to naval work.

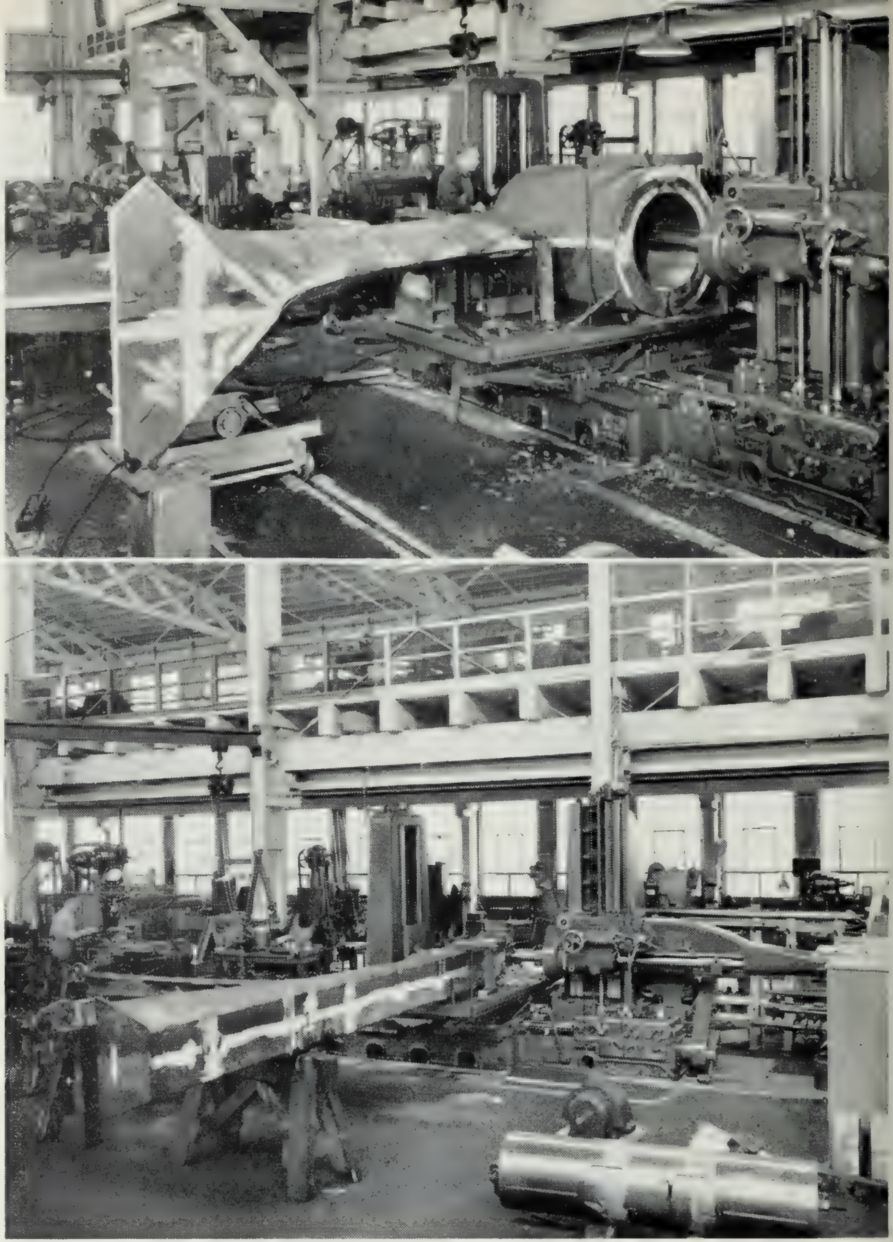
Union Plant is under the management of experienced executives. It has a very competent technical staff, and has access to a wealth of technical advice and assistance from the great shipbuilding organization of which it is a part. It has adequate equipment and ample capital available to get more, if and when needed. This plant will soon be operating at full speed, will be employing many thousand men and will be turning out goods ships with efficiency and dispatch, as it did in the former national emergency.

Moore Dry Dock Co.

Next in order of age among San Francisco Bay shipbuilders is the Moore Dry Dock Company, formerly the Moore Shipbuilding Company, nee Moore & Scott Iron Works, founded in 1908. To this firm go the honors for being the first Pacific Coast shipbuilding organization to break into the U. S. Maritime Commission construction program. Their first contract in this program was for two C-3 cargo vessels, and was signed on January 25, 1939.

Moore's technical staff and their staff of yard and shop executives were intact and ready for work. Since laying the first keel on March 18, 1939, they have built and launched four C-3 vessels for the Maritime Commission, and are now busy finishing the outfitting and equipping of the last two.

The first ship of these four was christened Sea Arrow. She was accepted by the



Two views in machine shop, Moore Dry Dock Company, showing boring of 16-ton section of cast steel stern frame for C-3 cargo vessel ↑

↓ *Waterfront of Moore Dry Dock Company, showing four large vessels under construction and four under repair*

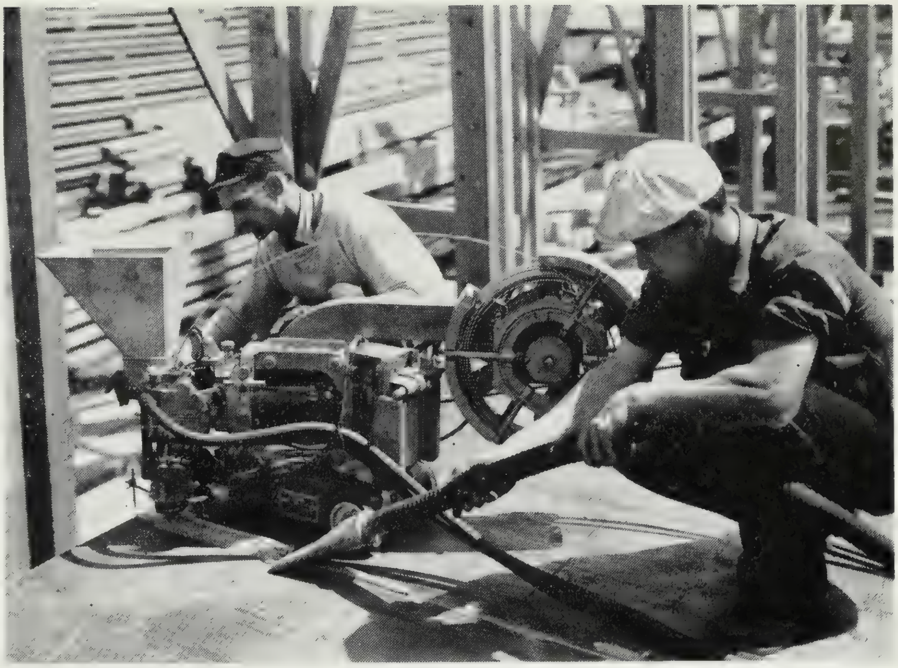
Maritime Commission after complete dock, bay and deep sea trials, and then turned over to the U. S. Navy. The Navy rechristened her U. S. S. Tangier, and immediately turned her back to the Moore yard for conversion to a U. S. Navy seaplane tender.

The second ship, Mormacstar, after trials was delivered to Moore-McCormack Lines, Inc., and by them turned back to the Moore yard for installation of refrigerated cargo space and refrigerating machinery.

All the experts who have examined these ships are enthusiastic in their praise of the excellent workmanship and fine finish both of the hull and of the machinery installation.

The Moore Dry Dock Company has on the ways under construction three special barges for the Dravo Corporation and the U. S. Navy, and two caisson gates for the U. S. Navy Bureau of Yards and Docks. One of these gates goes to the new graving dock at Pearl Harbor, Honolulu, and the other to the new graving dock at Puget Sound Navy Yard, Bremerton, Washington. Each gate is quite a hull, having a length of 150 feet, a beam of 22 feet, a depth of 57 feet and a light displacement of 1800 tons.

Contracts held by Moore now include: three C-2 cargo and passenger steamers for the U. S. Maritime Commission and the Alcoa Steamship Company, two submarine tenders for the U. S. Navy, and five submarine rescue ships for the U. S. Navy.

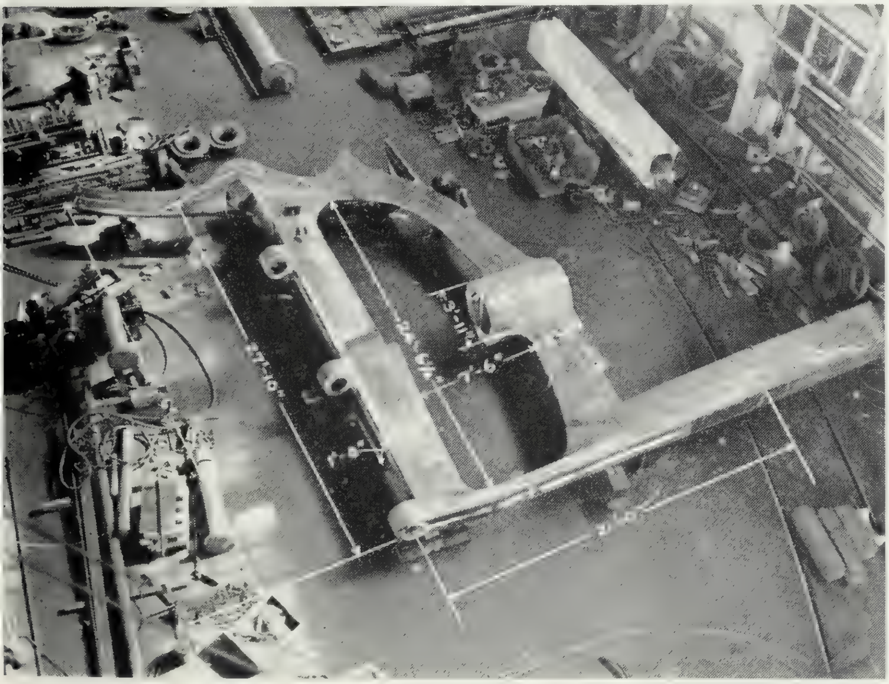


Unionmelt system of automatic welding at work on bulkhead assembly, Moore Dry Dock Co.

This yard has very complete equipment of machinery for fabrication by either welding or riveting. Its shops are fitted with modern tools manned by first class craftsmen. The machine shop is operating on high, being filled with work in connection with the ship contracts on hand, as well as much outside work. An interesting contract of the latter variety, and now in process through the shop, is some forty crankshafts for the main diesel engines for the anti-submarine net tenders now building at various yards throughout the country.

In preparing for Maritime Commission work, Moore's laid out one building way with ample room at the inshore end and on both sides for racks for welding assemblies. With the new contracts piling up, and their large run of repair work, an expansion program will be necessary. This is being provided through lease of adjacent acreage from the Port of Oakland.

Moore Dry Dock Co. is now employing approximately 2400 men, and on its expanded basis will probably need at least double that number.



Complete assembly of cast steel stern frame for C-3 vessel, Moore Dry Dock Co. Weight, 43 tons

Western Pipe & Steel Co.

At South San Francisco, in 1917, a yard was built for the construction of 8800-dwt. cargo steamers for the Emergency Fleet Corporation. A long channel to deep water in the bay, and a basin for side launching, were dredged and side launching ways built on each side of the basin with sufficient length to take four of those ships. After the war, this plant, which was owned by Western Pipe & Steel, became a fabrication plant for large pipe line and other industrial construction. Here was developed much of the modern technique in pipe and construction welding, and here shipbuilding has been revived with a contract to build five C-1 cargo motorships for the Maritime Commission. Three of these have already been launched, and the other two are well in frame on the ways. Western Pipe and Steel Co. elected under these contracts to do a completely welded job, and they are being highly complimented on their finished product.

So well pleased is the Maritime Commission that this yard has been awarded an additional contract calling for four C-3 cargo steamers. The yard at South San Francisco is equipped with a large plate and fabrication shop, and has ample facilities for the erection of hulls. One of the most extensive and complete welding equipments on the Pacific Coast is installed, and the long experience of this firm in large welding operations has enabled them to set up a welding procedure and technique on ships' hulls that has drawn very favorable comment from welding experts.

Practically all machine work on hull fittings on the installation of machinery, and on the adjustment of equipment, is being handled in the San Francisco shops.

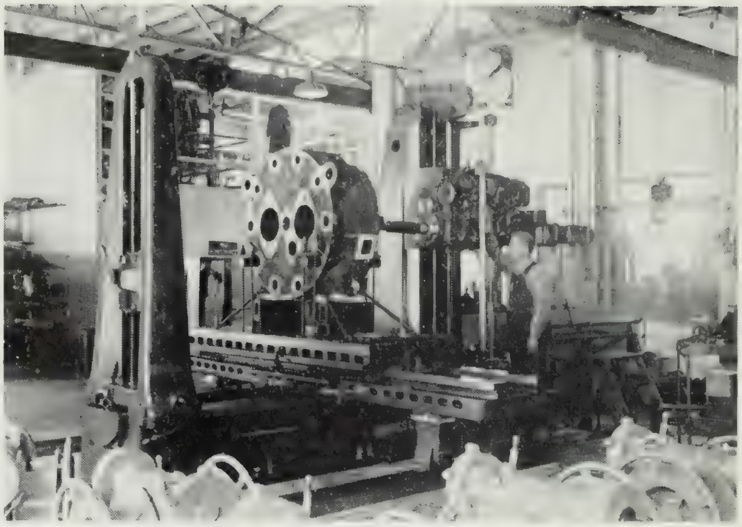
General Engineering & Dry Dock Co.

General Engineering maintains extensive shops in San Francisco, and a very well laid out and adequately equipped shipbuilding and repair yard in Alameda on the Oakland inner harbor estuary. It was founded in 1922 by a group of the most experienced shipbuilders and marine engineers on the Pacific Coast. Since that time, this firm has built a number of very fine commercial and Government vessels, and has had a very good share of the ship repair and maintenance business on San Francisco Bay.

The management is very progressive in adopting modern equipment, and in the initiation and the development of new ideas and mechanisms. The yard at Alameda is new and modern in its plans for flow of material and for preparation of welded assemblies. It has ample room for considerable expansion.

Present contracts include four anti-submarine net tenders at a total cost estimated to be approximately $2,036,000, and four mine sweepers at a total price of $6,720,000.

General Engineering & Dry Dock Company is a potent factor in shipbuilding on San Francisco Bay, and will be growing in size and importance as the present shipbuilding movement develops its full strength.



Large horizontal boring, drilling and milling machine at General Engineering & Dry Dock Co. at work on a cylinder head for a large marine diesel

Pacific Bridge Company

This California firm is usually engaged in general contracting work, and has had considerable experience in the fabrication and erection of large floating or submersible water-tight structures, such as bridge pier caissons, dredge hulls and barges.

On competitive bids, they were awarded a contract to build for the U. S. Navy a seagoing floating dock to be based on Mare Island Navy Yard. The bid was $1,649,000. The firm has on lease three or more acres on Oakland's outer harbor waterfront, part of the site formerly occupied by the Union Construction Company. This site is to be used for fabrication and erection of the dock. The dock itself is to be constructed with a closed ship-form bow, a conventional cargo vessel midship section form throughout its length, and a stern cut off square with an open end of the dock recess. It will be towed out to sea for the purpose of picking up any medium or small Navy ships that may be in distress.

Todd-California Shipbuilding Corporation

Just as we are preparing this article, the much-publicized British shipbuilding effort has crystallized into two contracts, each to build thirty ships at a cost reported to be estimated at $50,000,000. These contracts were negotiated with the British Purchasing Commission by two firms, each of which is a Todd affiliate. Under these contracts: the Todd-Bath Corporation will build thirty vessels at a yard to be prepared especially for that purpose on a site near the Bath Iron Works and to be managed by the Bath Iron Works' technical staff; and the Todd-California Shipbuilding Corporation will build thirty vessels in a yard to be especially prepared for that purpose on a leased site at Richmond, California, and to be under the supervision of the Todd Puget Sound organization combined with the "Six Companies" organization.

The ships will be simple cargo carriers 416 feet long, 57 feet beam, and of 10,000 tons total deadweight capacity. They will be powered with triple expansion reciprocating engines and cylindrical fire tube (Scotch) coal-burning boilers generating steam at 200 to 220 lbs. pressure, to produce about 2400 shp for a little better than 10 knots sea speed.

The yards will be simple fabrication and erection plants with ample equipment for weight handling, riveting and welding. All building of machinery will be done in established plants. It is rumored that most of the engines will be built in the old Joshua Hendy Iron Works at Sunnyvale, which has recently been sold, reputedly to interests affiliated with the Six Companies.

The yard at Richmond is now under construction, and will be completed within four months of December 20, the date on which work began. Schedules call for laying of first keel on or before March 7, and it is reported that the firm expects to have all thirty ships off the ways in approximately eighteen months from first keel laying. This could be done in a five-way yard by practically perfect coordination of the flow of materials and equipment.

Shipbuilding in Southern California

Los Angeles Shipbuilding & Dry Dock Co.

This yard, located on the Los Angeles inner harbor at San Pedro, is now busy after a long period of new construction famine. The shops have been reconstructed, and all machinery put in good working condition. Piping and wiring has been overhauled and put in good working order. Industrial trackage has been realigned and relaid. A new shipbuilding way has been built. Ample crane capacity is installed, together with modern equipment for fabricating, welding, flame-cutting and riveting.

The firm now has U. S. Navy contracts for three fleet repair vessels at a cost reported in the press to be approximately $13,000,000 each, and has been granted an allotment of $950,000 to be expended in yard expansion and equipment.

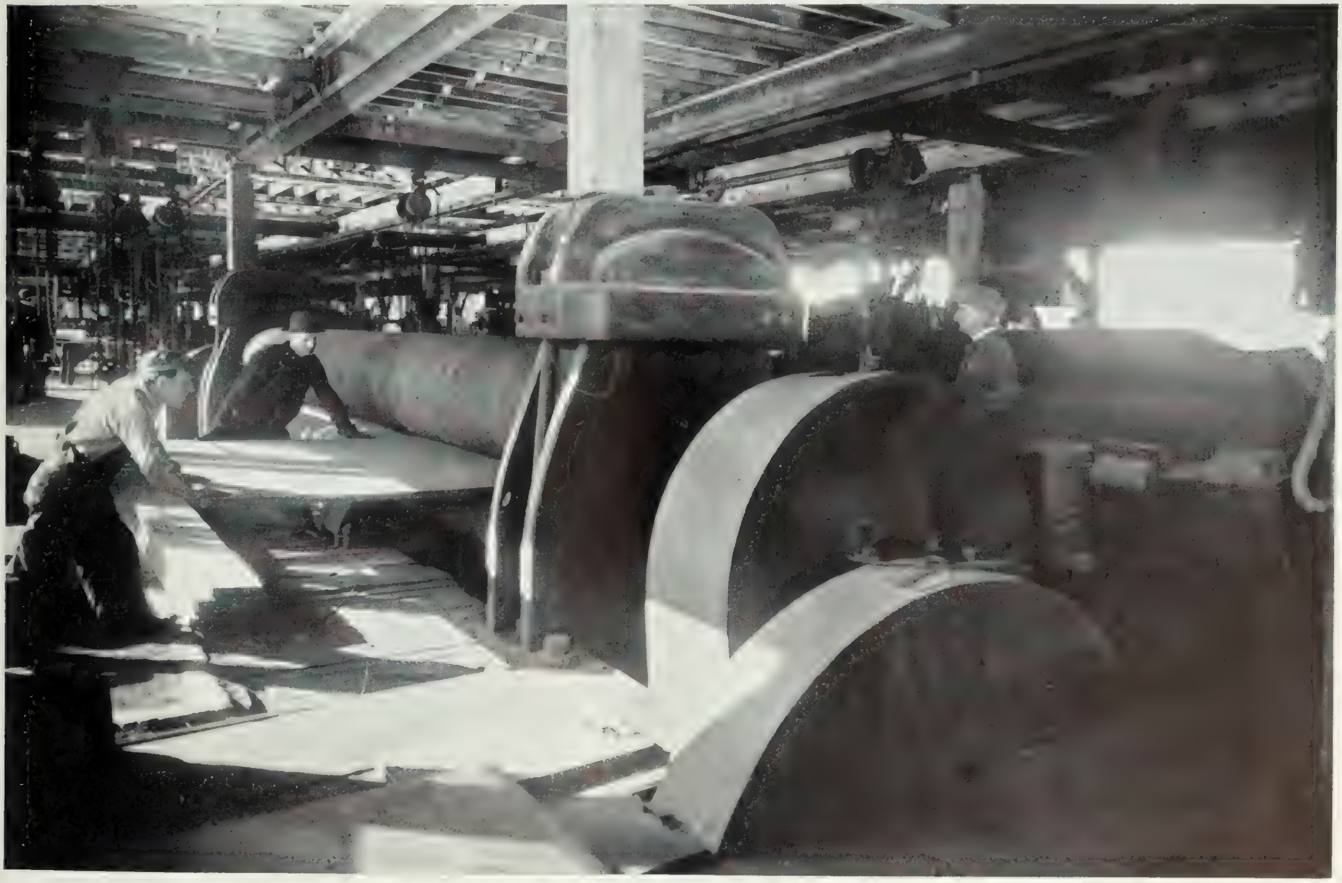
The new shipbuilding way is equipped with overhead cranes, and has ample welding rack space all around. Shops in this yard have always been adequate, both in space and equipment. In fact, during the former World War, when many fine cargo carriers and tankers were built here, the power plants and much of the auxiliary machinery for some of the vessels were built in these shops.

The yard has been maintained as a repair plant during the slack years, and so has held together a very competent group of technical experts and executives. Now under the management of these experienced shipbuilders, the Los Angeles Shipbuilding & Dry Dock Company is ready to assume its share of building up the American naval and merchant fleets under the National Defense Program.

Bethlehem San Pedro Works

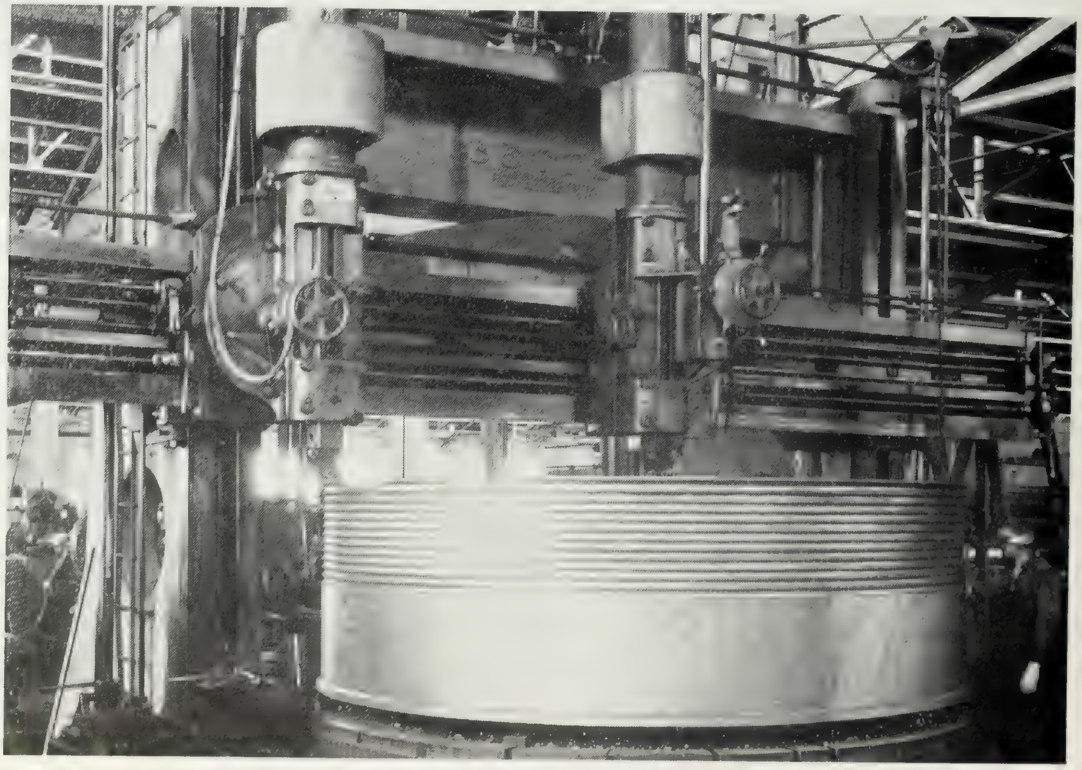
This yard, known during the last war as the Southwestern Shipbuilding Company, is located at the west end of Terminal Island on the east shore of the main channel to Los Angeles' inner harbor. When the great shipbuilding program of the Shipping Board was finished, Bethlehem recognized the strategic location of the yard and transformed it into a compact, well-equipped repair and drydock plant that has been kept fairly busy at repairs and maintenance jobs.

Now the Bethlehem San Pedro yard has been allotted ten torpedo boat destroyers on the U. S. Navy National Defense Program, and also several million dollars of Federal funds for rebuilding



The large rolls in plate shop, Los Angeles Shipbuilding and Dry Dock Co., are 32 feet long

The machine shop is over 500 feet long, and is equipped with ample cranes and with machine tools adequate for all shipyard work



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This large vertical boring mill illustrates the husky type of tools that are installed in the shops of Consolidated Steel Corp., Los Angeles

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and equipping to make it a modern fabrication and erection plant for torpedo boat destroyers and similar vessels.

San Pedro Works is a part of the Union Plant of the Shipbuilding Division of the Bethlehem Steel Co., and has the advantage of all the experience and knowledge of the competent technical staff maintained at the Potrero Works of that plant. Work is going ahead rapidly on the building of the ways and the rebuilding of the shops. In a few months the frames of torpedo boat destroyers will be one of the sights for passengers and crews of vessels coming into Los Angeles Harbor.

Consolidated Steel Co.

The Consolidated Steel Company of Los Angeles has a huge steel fabrication and general engineering plant at Maywood, a suburb of Los Angeles. They have handled in recent years some very large pipe line, power line, steel building and other fabrication, erection and installation jobs.

When the Maritime Commission brought out its C-1 type of hull, Consolidated suddenly determined to go into the shipbuilding field. They made arrangements to lay out and fabricate at Maywood, and leased part of the Long Beach Shipbuilding Co. plant for erection purposes. They were low bidder on the first tenders for C-1 steamers, and were the first yard on the Pacific Coast to be granted a contract to build these vessels. An Atlantic Coast yard beat Consolidated by less than one month on the contract date.

Since taking a contract to build four C-1s, Consolidated has purchased a shipyard in Orange, Texas, and has acquired a U. S. Navy National Defense contract to build twelve 2100-ton torpedo boat destroyers. A complete new yard for this construction is now being built at the Orange, Texas, site, and hulls will soon be in progress on the ways there.

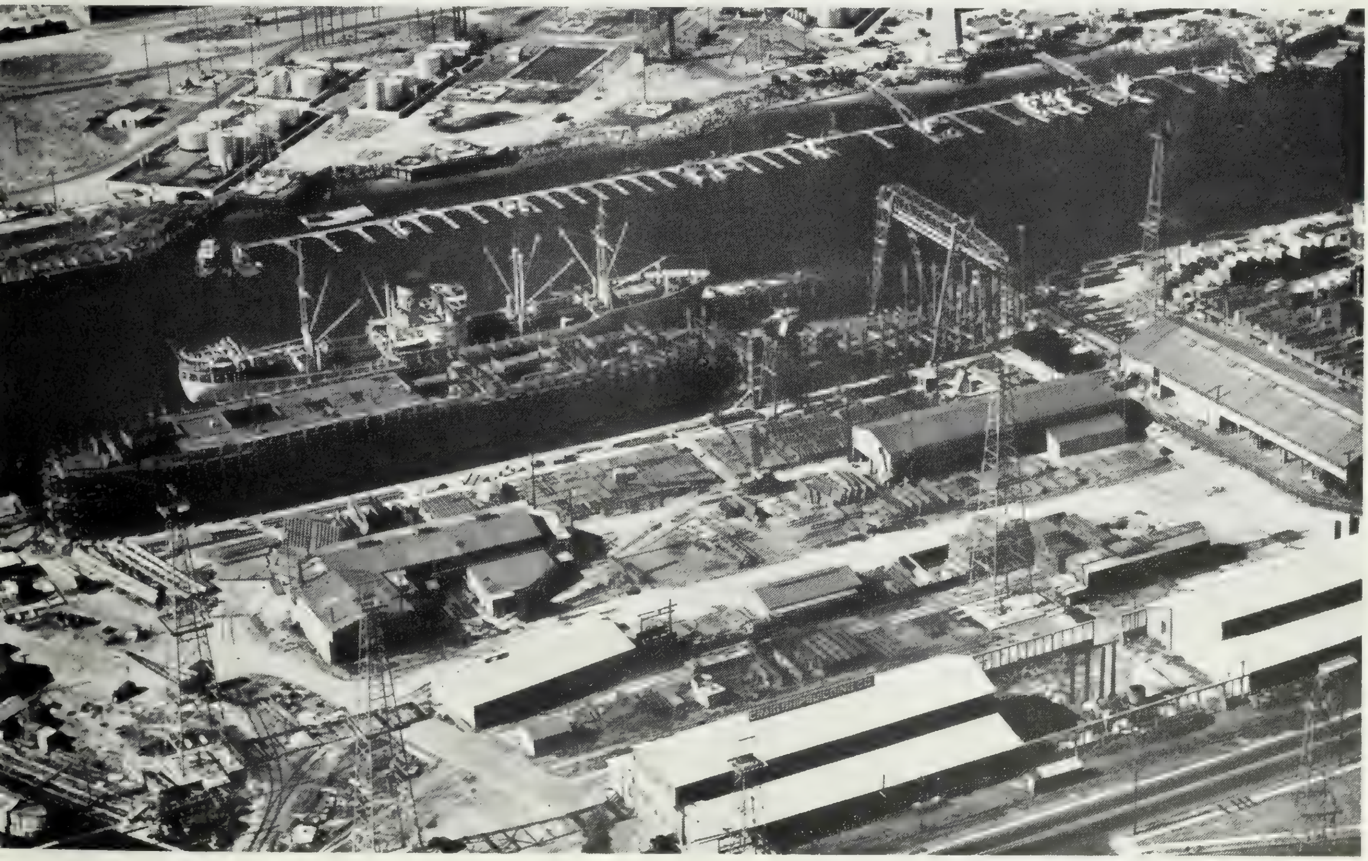
Meanwhile Consolidated, at its Long Beach yard, has launched and is rapidly completing the first of the four C-1s. The erection scheme is one and a half hulls on the long sidewise launching way. When No. 1 is launched, the stern half of No. 2 is about complete. Immediately after launching, keels are laid for the bow end of No. 2 and the stern end of No. 3. The full length of the available way is thus kept busy.

Summary

This sketchy survey covers the main shipyards that are busy now on National Defense contracts from the Navy, the Army and the Maritime Commission.

However, this survey does not cover all the items involved. There are large construction projects in the Navy yards and at various supply depots and harbor terminals that would add millions to this total. For instance: the U. S. Navy has a three- to five-million-dollar program for large shops and betterments at Hunter's Point Dry Docks, which they recently took over from Bethlehem; the Navy supply base and the seaplane base on San Francisco Bay are running into large sums; the various housing projects to take care of shipyard workers at Navy Yards will make more millions.

There is sufficient evidence that Pacific Coast is going to have much work for many mechanics in 1941 and the years following, and that there will be much opportunity in this section for enterprising firms who handle "Blue Ribbon" equipment and machinery to strengthen their marketing position by a judicious use of "Blue Ribbon" publicity.



Aerial perspective of the Long Beach yard of Consolidated Steel Corporation, showing arrangement of ways, buildings and fabricating park. Note oil well derricks. This picture was taken on October 3

Steady as you go!

KNOWLEDGE IS THE STRAIGHT COURSE TO ADVANCEMENT

A Department for Deck Officers

by "The Skipper"

Questions Welcomed. Just Address "The Skipper," Pacific Marine Review, 500 Sansome Street, San Francisco, California

ASSISTANT INSPECTOR

EXAMINATION QUESTIONS AND ANSWERS

The examination for Assistant Inspector of Hulls, as announced in last month's issue, will be held on January 28, 1941. This examination seems to be one of wide interest to a great many of our readers, and so we will interrupt our regular series and answer the questions asked in the last examination, held April 3-4, 1940.

RULES OF THE ROAD

QUESTION

1. What is the dividing line between the high seas and inland waters?

ANSWER

Dividing lines between the high seas and inland waters have been established for specific areas on the Atlantic, Pacific and Gulf coasts of the United States. If no specific lines are prescribed, then the dividing line at all buoyed entrances from seaward to bays, sounds, rivers, or other estuaries shall be a line approximately parallel with the general trend of the shore, drawn through the outermost buoy or other aid to navigation of any system of aids.

QUESTION

2. What do the words "steam vessel" mean under International Rules?

ANSWER

The words *steam vessel* shall include any vessel propelled by machinery.

QUESTION

3. When is a vessel considered "under way"?

ANSWER

A vessel is considered *under way* when she is not at anchor, or made fast to the shore, or aground.

QUESTION

4. When shall passing signals be given?

ANSWER

Passing signals shall only be given when vessels are in sight of one another.

QUESTION

5. When is risk of collision deemed to exist?

ANSWER

Risk of collision can, when circumstances permit, be ascertained by carefully watching the compass bearing of an approaching vessel. If the compass bearing does not appreciably change, such risk should be deemed to exist.

Deck Officers' Licenses for November

Name and Grade	Class	Condition
SAN FRANCISCO		
R. B. Nickerson, Master	SS & MS, any GT	RG
W. E. Davies, Chief	SS, any GT	RG
M. H. Barber, Chief	SS, any GT	RG
M. Wechesloff, Chief	SS, any GT	RG
A. Gregory, 2nd Mate	SS, any GT	RG
S. F. Castle, 3d Mate	SS, any GT	O
W. E. Townsend, 3d Mate	SS, any GT	O
V. A. Johnson, 3d Mate	SS, any GT	O
E. P. Allen, 3d Mate	SS, any GT	O
S. M. A. Rogenes, 3d Mate	SS, any GT	O
SAN PEDRO		
W. A. Griffen, Master	SS, any GT	RG
H. G. Sorensen, Chief	SS, 6000 GT	RG
R. W. Kleid, 2nd Mate	SS, any GT	RG
R. J. Beal, 3d Mate	SS, any GT	O
PORTLAND		
W. M. Caldwell, 3d Mate	SS, any GT	O
SEATTLE		
F. A. Roegner, Master	SS, any GT	RG
L. A. Ballah, Master	SS, any GT	RG
C. B. Ogle, Chief	SS, any GT	RG
A. B. Ford, 2nd Mate	SS, any GT	RG
D. E. Parker, 2nd Mate	SS, any GT	RG
A. M. Sundt, 3d Mate	SS, any GT	O
H. H. Mathis, 3d Mate	SS, any GT	O

Abbreviations: SS is steamer; MS is motorship; GT is gross tonnage; O is original license; RG is raise of grade. All of these licenses are for ocean service.

QUESTION

6. What does the word "visible" mean?

ANSWER

The word *visible*, when applied to lights, shall mean visible on a dark night with a clear atmosphere.

QUESTION

7. Suppose you were under way and running parallel to a fog bank, your ship is not in the fog, you hear a fog signal from a vessel in the fog bank, what would you do?

ANSWER

Sound fog signals and stop my engines, and then navigate with caution until danger of collision is over. (Articles 16 and 29.)

QUESTION

8. You have backed out of a slip, still have sternway on your vessel, you give one blast on the steam whistle; what does this indicate?

ANSWER

It indicates that I am altering my course to the right, with reference to the direction of motion of the ship.

NOTE: An interesting and important point arises when one of two crossing vessels is going astern instead of ahead. It is the practice of seamen to consider in such cases that the rules apply with reference to the direction of motion of the ship, so that for the time being, the starboard side becomes the port side and the port side the starboard side. This practice has been sanctioned by several decisions of the courts, and may be regarded as fully established. In other words, we must consider the pilot of a backing vessel to be facing aft, toward the direction in which his ship is moving. He must then keep clear of a vessel on his right hand as if that were his starboard side, and his whistle signals must correspond. Similarly, the vessel which is crossing him must regard the stern of the backing vessel as if it were the bow, etc.

QUESTION

9. Explain the General Prudential Rule.

ANSWER

Article 27: "In obeying and construing these rules, due regard shall be had to all dangers to navigation and collision and to any special circumstances which may render a departure from the above rules necessary in order to avoid immediate danger."

This article is entitled the General Prudential Rule. It is obviously a rule for exceptional situations—an emergency rule. Although the other rules are so complete as to provide for most situations, they cannot in the nature of things contemplate every possible situation or emergency. Outside perils or the improper navigation of other vessels may present exceptional conditions under which strict adherence to the definite rules would plainly invite collision or other disaster, which skill and good seamanship, though involving a departure from the rules, might avert. In such circumstances, this article permits and even requires maneuvers to avoid pressing danger that would otherwise be a breach of the rules.

QUESTION

10. Explain "moderate" speed, as defined by the courts.

ANSWER

Moderate speed is a relative term. It cannot be defined so as to apply to all cases; what it should be in each case depends on circumstances of the particular case. No ship should travel at such speed as not to be able to avoid accident. Moderate speed depends to a great extent on engine power to back. No ship has a right to navigate at such a speed that it is impossible for her to prevent collision. Moderate speed should mean the ability of the ship to stop all headway within half the range of visibility. Dead slow is the only word to apply.

Moderate speed has been very specifically defined in two decisions of the U. S. Supreme Court. These decisions, in substance, provide that the moderate speed contemplated by law for any vessel shall be such that she can take off all her way in half the distance of visibility, and that where the visibility is practically nil (less than a quarter of a mile) and traffic is to be expected, moderate speed is bare steerage way.

QUESTION

11. Does a sailing vessel always have the right of way over a steam vessel?

ANSWER

A sailing vessel has the right of way over a steam vessel at all times, except when she is the overtaking vessel or the steam vessel is not under command.

QUESTION

12. What are the day and night signals for a vessel not under command? Does such a vessel carry her side lights?

ANSWER

A vessel which from any accident is not under command shall carry at the same height as a white light mentioned in Article two (a), where they can best be seen, and if a steam vessel in lieu of that light two red lights, in a vertical line over the other, not less than six feet apart, and of such a character as to be visible all around the horizon at a distance of at least two miles; and by day shall carry in a vertical line one over the other, not less than six feet apart, where they can best be seen, two black balls or shapes, each two feet in diameter (Art. 4(a).) The vessels referred to in this article, when not making way through the water, shall not carry the side lights, but when making way shall carry them (Art. 4(c).)

GENERAL RULES AND REGULATIONS

QUESTION

1. What is the rule concerning fire alarm bells?

ANSWER

All vessels over 100 gross tons shall have all sleeping accommodations equipped with a sufficient number of alarm bells so located as to warn all the occupants. The alarm bells, if electric, shall be operated from an open switch from the pilot house or bridge. The bells shall be of such size, character and construction as to provide an alarm throughout the spaces for which they are provided.

QUESTION

2. What is the rule concerning precautions to be taken on passenger vessels where the height of the boat deck exceeds 20 feet from the lightest seagoing draft?

ANSWER

On passenger vessels, where the height of the boat deck exceeds 20 feet from the lightest seagoing draft, wire falls and mechanical means for lowering shall be provided for each lifeboat. The wire ropes shall be securely attached to the drum of the boat winch. The winch drums are to be arranged to keep the two falls separate, and the lead of the wires shall be such that they will wind evenly on the drums, and in such manner that the falls may be paid out at the same rate. Brake gears are to be so arranged that normally they are in the "on" position and return to the "on" position when the handle is not being operated. When more than one lifeboat is served by the same wire falls, the winches shall be fitted with quick return hand gear so that the falls may be rapidly recovered.

QUESTION

3. What is the rule concerning electrical wiring in a new ship?

ANSWER

The type of electrical equipment and the types of electric cables to be in the various parts of all vessels constructed after January 1, 1939, shall be in accordance with the "Recommended Practice for Electrical Installations on Shipboard," A.I.E.E. Standard No. 45, December, 1938, as published by the American Institute of Electrical Engineers.

QUESTION

4. What is the rule concerning lifelines on passenger vessels where airports 16 inches or more in diameter in the hull of the vessel open into the passageways?

ANSWER

Airports 16 inches or more in diameter in the hull of all passenger vessels that open into the passageways shall have a lifeline securely fastened overhead within the passageway. This lifeline shall be not less than 2 inches in circumference, knotted every 3 feet, and of sufficient length to reach the water at the lightest seagoing draft.

QUESTION

5. What is considered "buoyant apparatus"?

ANSWER

Buoyant apparatus is defined as buoyant deck seats, buoyant deck chairs, and light floats or other apparatus having buoyancy, except lifeboats, lifebuoys and life preservers, and no buoyant apparatus shall be approved which requires any adjustment or preparation.

QUESTION

6. What is the rule concerning persons to be excluded from the pilot house?

ANSWER

Masters and pilots of vessels carrying passengers shall exclude from the pilot house and navigator's bridge of such vessels, while under way, all persons not connected with the navigation of such vessels, provided: That officers of the Bureau of Marine Inspection and Navigation, licensed officers of vessels, persons regularly engaged in learning the profession of pilot, officers of the U. S. Coast Guard, U. S. Navy, U. S. Coast and Geodetic Survey and the Engineer Department of the U. S. Army, may be allowed in the pilot house or upon the navigator's bridge upon the responsibility of the officer in charge.

QUESTION

7. What is the rule concerning emergency lighting?

ANSWER

Provision shall be made on all passenger vessels for an electric or other system of lighting sufficient for all requirements of safety in the different parts of the ship. There shall be a self-contained source capable of supplying, when necessary, this safety lighting system, and placed in the upper parts of the ship above the margin line.

The exit from every main compartment occupied by passengers or crew shall be continuously lighted by an emergency lamp. The power for these emergency lamps shall be so arranged that they will be supplied from the independent installation referred to in the preceding paragraph in the event of failure of the main generating plant.

QUESTION

8. What vessels are required to be equipped with a signaling lamp? A direction finder?

ANSWER

Ocean and coastwise passenger ships over 150 gross tons shall be equipped with an efficient signaling lamp. This lamp shall be permanently fixed on the bridge, and equipped with a fresnel lens and high-speed Morse bulb of at least 50 candlepower, and operated by a weatherproof key, fitted with a suitable condenser. The lamp shall be so connected that it can be operated from the normal source of ship's current, the emergency source, and other emergency batteries provided.

Ocean passenger vessels over 5,000 gross tons shall be provided with a radio direction finding apparatus, which shall be inspected and approved by Federal Communications Commission and kept at all times in efficient condition.

If the direction finding equipment is not installed on the navigating bridge, efficient communication shall be provided from the apparatus to the bridge in accordance with all the requirements of Rule VI, Section 11, Ocean and Coastwise.

QUESTION

9. What is the rule concerning the safeguarding of lifeboat falls?

ANSWER

It shall be the duty of the master or officer in charge of all vessels to see that the boat-davit falls shall at all times be in readiness for immediate use, and protected from ice, and not painted, and such boat-davit falls on all boats not swung out at boat drills shall be cast loose and overhauled; and it shall be unlawful to stow in any lifeboat articles other than those required by law and regulations. On all steamers over 1,000 gross tons, covered tubs, boxes or reels shall be provided in which to stow away the boat-davit falls.

QUESTION

10. What is the rule concerning Notice to Mariners?

ANSWER

Licensed officers are required to acquaint themselves with the latest information published by the Department of Commerce regarding aids to navigation, and neglect to do so is evidence of neglect of duty. It is desirable that vessels navigating oceans and coastwise and Great Lakes waters shall have available in the pilot house for convenient reference at all times a file of the Department of Commerce weekly, Notice to Mariners.

QUESTION

11. What is the rule concerning numbering and marking lifeboats?

ANSWER

The number of each lifeboat shall be plainly marked or painted on each side of the bow in figures 3 inches high; and, where lifeboats are carried on both sides of the vessel, the odd-numbered boats shall be stowed on the starboard side and the even-numbered boats on the port side; i.e., lifeboat No. 1 shall be forward on the starboard side, and lifeboat No. 3 next abaft lifeboat No. 1; lifeboat No. 2 shall be forward on the port side and lifeboat No. 4 next abaft lifeboat No. 2, etc. Where lifeboats are nested, the lifeboat under lifeboat No. 1 shall be numbered 1A, the lifeboat under lifeboat No. 2 shall be numbered 2A, etc.

The cubical contents and number of persons allowed to be carried on each lifeboat shall be plainly marked or painted on each side of the bow in letters and numbers 1½ inches high. In addition, the number of persons allowed shall be plainly marked or painted on the top of at least two of the thwarts in letters and numbers 3 inches high. Such letters and numbers shall be dark on a light ground or light on a dark ground.

QUESTION

12. What is the rule concerning the manning of lifeboats?

ANSWER

A licensed deck officer or a certificated lifeboatman shall be placed in charge of each boat or life raft by the master, and a second in command shall also be nominated by the master. The person in charge shall have a list of its crew, and shall see that the men placed under his orders are acquainted with their several duties.

A man capable of working the motor shall be assigned to each motorboat by the master.

A man capable of working the wireless and searchlight installations shall be assigned to boats carrying this equipment by the master.

The duty of seeing that the lifeboats, life rafts and buoyant apparatus and other life-saving apparatus are at all times ready for use shall be assigned to one or more officers.

STABILITY

QUESTION

1. What is meant by "metacentric height," and how is it found?

ANSWER

The metacentric height means the height of the metacenter above the center of gravity of the vessel. Generally the metacentric height is represented by the letters "G.M."

QUESTION

2. How would you compute the area of a vessel's waterplane and draw a sketch illustrating your method?

ANSWER

Divide vessel into an odd number of stations an equal distance apart. Suppose the equal distance apart "h" is 10 feet.

As the centerline of a vessel is midway between each side, the ordinates will be half the breadth of each station, and the resulting area must be multiplied by 2 to give the full area of the waterplane.

Proceeding by Simpson's First Rule:

Station	Ordinate	Simpson's Multipliers	Function Area
1	0	1	0
2	6	4	24
3	7	2	14
4	9	4	36
5	10	2	20
6	10	4	40
7	6	2	12
8	4	4	16
9	0	1	0

Sum f Area = 162

$$\text{Area} = \frac{h}{3} \cdot \text{Sum fA} = \frac{10 \times 162}{3} = 540 \times 2 = 1080 \text{ sq. ft.}$$

QUESTION

3. Describe "block coefficient" and "prismatic coefficient."

ANSWER

Block coefficient is the ratio usually expressed in decimals, which the volume of displacement of a vessel bears to a rectangular block of the same length, width and depth. (Same as coefficient of fineness.)

Prismatic coefficient expresses the ratio that volume of displacement bears to volume of a prismatic solid having a constant cross-section area equal to the midship-section area of vessel, and having a length equal to length of vessel on load waterline.

In other words, if the length of the boat on load water line is multiplied by the area of immersed cross-section, the volume of the prismatic solid will be ascertained. Then if this volume is multiplied by the proper coefficient, the volume of displacement of vessel can be ascertained.

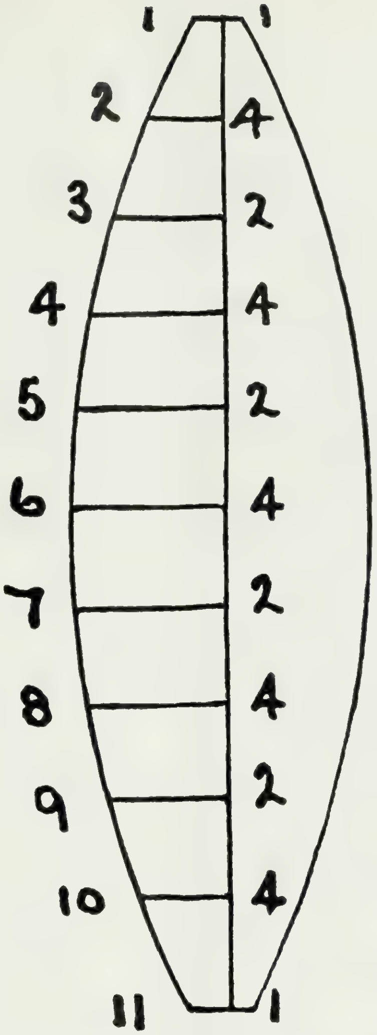
To ascertain the prismatic coefficient of any vessel, the volume of displacement is divided by the volume of prism.

QUESTION

4. A ship 250 feet long, 40 feet beam and a load waterline depth of 20 feet displaces 4060 tons. What is her block coefficient?

ANSWER

$$\text{Coefficient} = \frac{35 \times \text{Displacement}}{\text{Length} \times \text{Breadth} \times \text{Draft}} = \frac{35 \times 4060}{250 \times 40 \times 20} = 0.7105$$



Sketch illustrating method of computing area of water plane of vessel

STEEL HULL CONSTRUCTION

QUESTION

1. Give a description of the web frame form of construction?

ANSWER

This system is similar to the deep frame construction in that the framework is so strengthened as to render the two sides self-supporting and dispense with hold beams, but instead of uniformly increasing the strength of every frame, only every fifth or sixth frame is increased, but in a very large proportion, by means of a deep web plate transformed from a comparatively flexible bar into a strong and rigid girder. The size and distance apart of these frames is governed by the depth of hold, and is usually about ten feet apart. A web frame consists of a web of plating about fifteen inches wide extending from the tank side to the upper part of the deck beams. It is attached to the shell plating by angles of ordinary frame size, and has two smaller reverse angles fitted on its inner edge, or a single reverse angle bar of larger size. In this case the tank bracket knee should be of extra depth and the beam knees to the lower tier of beams should be three times the depth of beam. Web frames are often used where side cargo ports are used; also where beams are cut for hatches and in the engine and boiler space.

QUESTION

2. Describe the method of preventing panting in a steel vessel?

ANSWER

The provision usually made against panting is the introduction of one or two additional tiers of beams in the fore peak, and two or more beams in the fore hold abaft the collision bulkhead. The breast hook connects the forward end of the panting stringers, and thus becomes a part of them.

QUESTION

3. Why should the bow of a blunt-nosed vessel be well strengthened?

ANSWER

The full form often adopted in cargo steamers, and the need of quick deliveries in present-day trading, often involving long voyages in a light condition, are the causes of a form of weakness which is sometimes observed, but which is not so apparent when finer lines and lower speeds is the rule. This weakness usually shows itself on the bottom of the ship under No. 1 hold, in the buckling of the plating between the frames, in leakage through started seams and butts and by slack rivets.

When an insufficiently ballasted ship is being forced through a succession of head seas, the forward end beats into the oncoming waves like a hammerhead. The result is that the bottom from the stem aft for about a fifth of the ship's length is subjected to great impulse forces, which, unless provided against in the construction, will result in injuries similar to those indicated above. Further, if the fore peak tank is filled with water ballast, the weight concentrated in the fore peak accentuates the great momentum of this hammerhead, and the frequent change in direction of the motion brings severe stresses on the plating and longitudinal framing just abaft the peak bulkhead, and points to the need for a good connection of the parts on each side of the peak bulkhead.

QUESTION

4. In a passenger vessel of large construction, what provision is made to relieve hogging and sagging stresses?

ANSWER

In the upper works, like the passenger decks above the strength structure, expansion joints are put in the houses, rails and similar parts to allow movement and relieve stresses arising out of hogging and sagging.

QUESTION

5. Where would you look for corrosion in a coal burning steamer?

ANSWER

Coal bunker—from the sulphur in the coal.

Deck plates—where the coal is loaded.

Tank top—where the ashes are drawn and hosed down.

Ash ejector connection to ship's side.

QUESTION

6. A steel vessel 400 feet long, with a midship house 200 feet long, has been in a heavy seaway and reported as developing structural weakness. Where would you look for strains?

ANSWER

I would look at the forefoot and bilge from the bow along about a fourth of the ship's length; this because of the pitching and pounding while encountering the heavy seas. Also look in engine room, where the large opening in the deck is necessary for the machinery.

From a bending point of view, the structure is weakest amidships, due to the fact that when a hollow structure is bent it collapses at the point at right angles to the axis of bending.

From a shearing point of view, the vessel fails along the side at a point a fourth the length of the vessel from the bow and stern.

QUESTION

7. How would you test the following: Forepeak bulkhead, ordinary bulkhead, crown of the deep tank, double bottom?

ANSWER

Test an ordinary bulkhead with hose and water pressure, and fill with water the forepeak, deep tank and double bottom to test them.

QUESTION

8. What precaution would you take in welding a seam longitudinally, and what are locked up stresses?

ANSWER

The most important thing that a skilled welder must watch is contraction and expansion stresses. Regardless of the welder's skill, these cannot be entirely eliminated, and they result in what is known as locked-up stresses when the weld has been finished. This will be particularly noticeable when long, continuous welds are made by hand in longitudinal seams.

QUESTION

9. How are stringers connected at the stem?

ANSWER

They are connected to a breast hook at the stem, the breast hook being riveted directly to them and to the shell plating.

QUESTION

10. Describe the following: Intercostal keelson, stealer, transom, floor plate, reverse frame, breast hook, beam bracket, deck stringer?

ANSWER

Intercostal keelsons are plates fitted vertically and fore and aft, their upper edges connected to the keelson and their lower edges connected to the shell by short fore and aft bars. They are stronger than an ordinary keelson, and should in all cases be fitted to side and bilge keelsons. With a bar keel, their fore and aft edges are connected to the floors with angles when fitted to a middle line keelson.

A stealer strake is introduced in the shell and deck plating toward the ends of the vessel when, owing to the reduced breadth of the plating, two strakes may conveniently be merged into one. The single strake is called a stealer, as each time it is fitted, the number of strakes is reduced by one.

A transom plate is a transom floor at the head of the stern frame, to which it is attached with angles. The ends of the transom plate are fastened to the frames on either side, and thus it stiffens the counter.

Floor plates are vertical plates placed on every frame in bilge of vessel, fastened to frame angles and reverse angles by rivets, and to keelson plates by an angle clip, which are riveted to floor and keelson plate.

A reverse frame is an angle bar or other shape riveted to the inner edge of a transverse frame to reinforce it.

A breast hook is a plate structure fitted inside the hull near the bow to give local strength to the shell plating.

A beam bracket is a plate at ends of beam, riveted to beam and frame.

A deck stringer is the strake of plating that runs along the outer edge of a deck.

QUESTION

11. Draw a side bar keel.

ANSWER

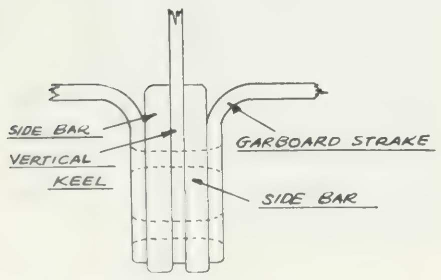
(See sketch.)

QUESTION

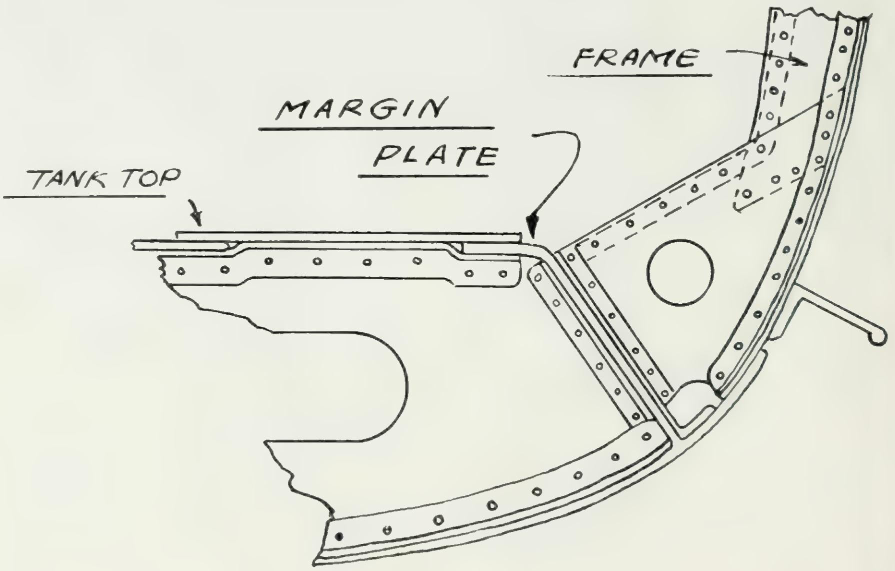
12. Draw a sketch of a margin plate, showing the junction of a frame and the fastenings.

ANSWER

(See sketch.)



SIDE BAR KEEL



WOODEN HULL CONSTRUCTION

QUESTION

1. **Define the following members of a wooden vessel: keelson, floors, apron, transom, breast hook, binding strake.**

ANSWER

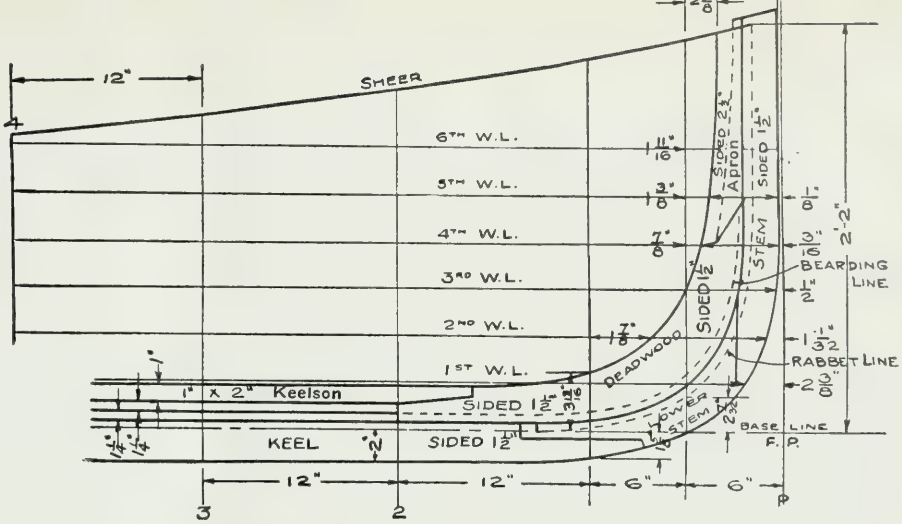
A keelson is the timber, formed of long square pieces of oak, fixed within the ship exactly over the keel for binding and strengthening the lower part of the ship, for which purpose it is fitted to, and laid upon, the middle of the floor timbers, and bolted through floors and keel.

Floors are the timbers that are fixed athwart the keel, and upon which the whole frame is erected. They generally extend as far forward as the foremast and as far aft as the after square timber, and sometimes one or two cant-floors are added.

The apron is a timber conforming to shape of stem, and fixed in the concave part of it, extending from the head to some distance below the scarph joining upper and lower stem piece.

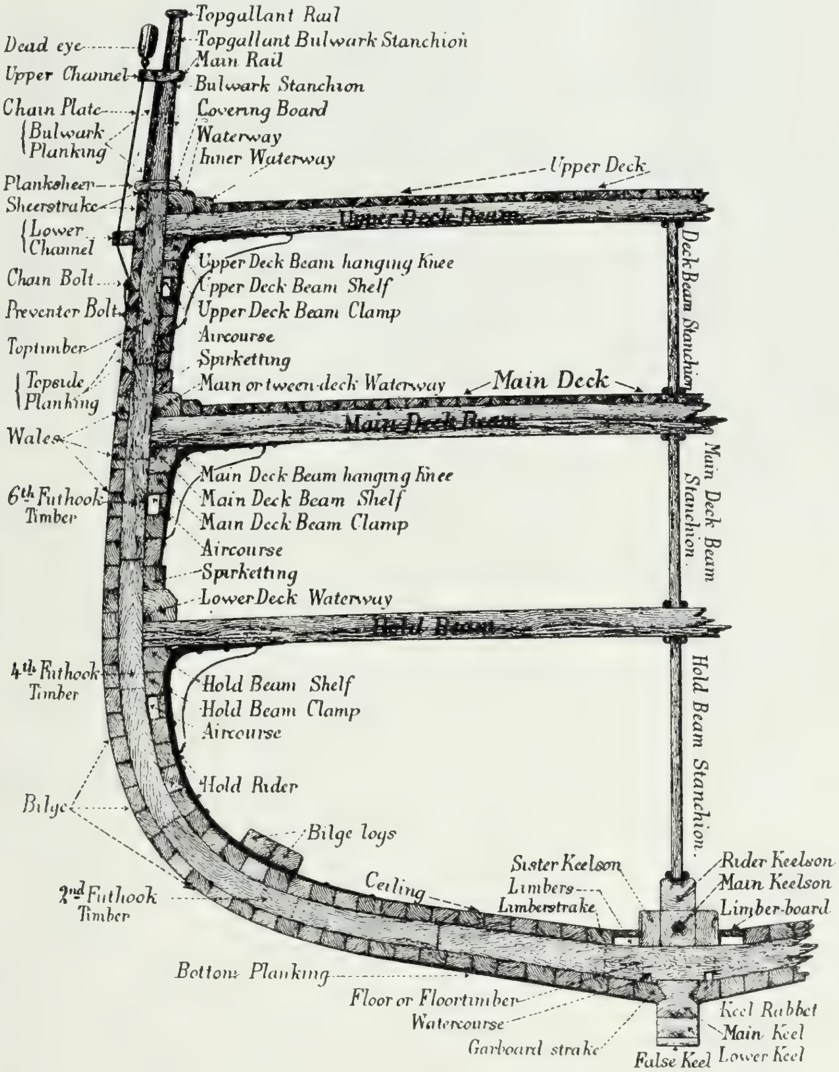
Transoms are transverse timbers in square-sterned ships, connected and placed square with the stern posts.

Breast hooks are large pieces of timber fixed within and athwart the bows of a ship, through which they are well bolted. There is generally one between each deck, and three or four below the lower deck, fayed upon the plank.



Stem of wooden vessel

Binding strakes are thick planks on decks, running just outside the line of hatches, jogged down over the beams and ledges.



Midship section, wooden ship

QUESTION

2. **What are the following parts of a wooden vessel, and tell how they are fastened: clamps, beams, floors, lodge knees, shelfs, pointers?**

ANSWER

Clamps are strakes of timber upon which the deck beams rest. They are bolted to the frame with clinch bolts, and on large ships there would be at least one treenail through the outside planking in each frame. Edge fastened to ceiling.

Beams are curved transverse timbers of a vessel supporting the deck. They are fastened to the clamps with drift bolts; alternate beams and sometimes every beam is fitted with a knee. Where there are no knees available, the corner is filled with fore-and-aft timbers. Above the beams a notch is cut, and the waterway timbers are fitted into the notch.

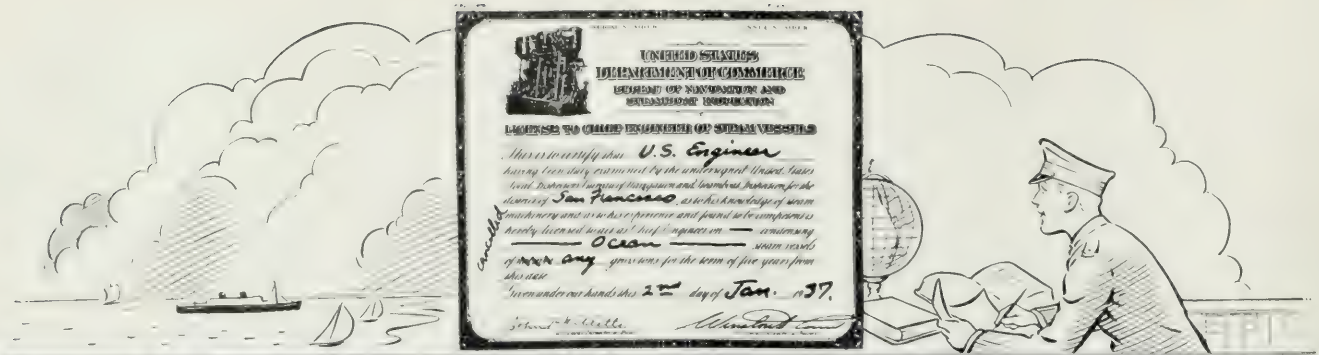
Half-beams are short beams introduced to support the deck where there is no framing, as in places where there are hatchways. The inboard end is fitted to the hatch carling and fastened the same as the beams.

Floors are the timbers that join the lower part of the frame where it crosses between the keel and the keelsons. The fastening of the keelson to the keel goes through the floors.

Lodge knees are knees fixed parallel to the deck. At the hatch corners they fasten the fore-and-aft carlings to the big hatch beams, and are bolted through the beam and the carling.

Shelfs are strakes worked for deck beams to rest on where iron hanging knees

(Page 100, please)



Your Problems Answered

by "The Chief"

"The Chief's" department welcomes questions—Just write "The Chief," Pacific Marine Review, 500 Sansome Street, San Francisco, California

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MARINE BOILERS

VII—MUD DRUM

QUESTION

Can drums of boilers be electric welded?

ANSWER

Yes. The subject is quite complicated, and is thoroughly covered in the G. R. R. 51st Supplement, page 119, Section 20.

The two main points are that the welders must be certificated by inspectors of the Bureau of Marine Inspection and Navigation, and the welds must be photographed by the X-ray or gamma ray method, and the pictures submitted to the inspectors.

Welding is a thoroughly accepted and standardized method of construction today, and is widely used.

QUESTION

How is the weakening effect of drilling holes in the drum reinforced?

ANSWER

Where many holes are drilled in the drums for tubes, the plate thickness of the drum is greatly increased. When the welding process is used, it permits of fabricating the drum out of two different thicknesses of plate, thus saving much in weight.

QUESTION

What is the purpose of the mud drum?

ANSWER

There are two very important and vital purposes, for which there seems to be no substitute method.

First, a drum or large header seems to be indispensible as a terminal for the water tubes. Second, and probably more important, a receiver with minimum exposure to the flame is needed at the bottom of the water spaces to receive the sediment or mud that settles out of the water.

Water treatment in shore plants is generally done outside of the boiler, so that sediment, the result of water treatment, does not get into the boilers. In spite of this, there is a necessity for continuous blow-down to keep the boiler water reasonably clear.

In marine plants, water treatment is internal, and the chemicals are injected directly into the feed or the boiler. The result is to cause the undesirable element to become insoluble and settle down as a mud at the bottom. This must be blown off. The size of the mud drum must be adequate to contain a reasonable accumulation of mud between blow-downs.

VIII—SELECTION OF MATERIALS

QUESTION

What elements must the designer consider in selecting materials for boilers?

ANSWER

No one point is more important than material selection in boiler design. To illustrate: It is easily possible to get steels to test 150,000 pounds per sq. inch, yet we find only 50,000- and 60,000-pound steels used. The reason is that factors other than tensile strength are important. The steel must be somewhat ductile, that is, yield a little under overstress. In fabricating, it is impossible to be sure there are no excessive overstresses, but if the material yields slightly, it relieves the stress or equalizes it. In some parts, and perhaps complete assemblies, it is customary to place it in an oven raised to a low red heat, thus stress relieving all parts. Also, the higher the tensile the more likely to crack from momentary stress or hammer blow. The alloying of steels to produce a selected material has reached a high state of development, even to the point of having different hardness at surface and beneath the surface to be strong yet resist wear or shock, such as journals in special machines, or armor plate steel with several grades of hardness throughout its thickness.

Castings are not permitted to carry loads in a pressure vessel, due to the uncertainty of texture and make-up. In special places, such as turbine casings, steel castings are used under controlled conditions and the liberal use of the X-ray in searching for flaws.

Steels that are wrought or worked by rolling or hammering are required for load-carrying parts of boilers. The working of the hot steel billet seems to ensure a minimum of flaws and to develop a desirable grain structure and fiber, which adds to strength and reliability.

Resistance to corrosion is a factor considered important in boiler steels. The addition of small amounts of an alloy metal may not affect other qualities, yet greatly add to its resistance to rust.

QUESTION

What steps are taken by inspectors to identify steels for boilers?

ANSWER

The identity of boiler steel is kept intact and complete from the molten charge in the steel-alloying furnace throughout the life of the boiler. Read thoroughly Rule I of the G. R. R., the thick blue booket.

The boiler manufacturer must make an affidavit describing the details of the boiler, and stating that he proposes to use steel plate inspected at the mill and stamped and dated by the U. S. inspector at the mill; or, if not using stamped steel, then he must submit test samples of the steel he proposes to use.

Furthermore, the inspectors follow the construction of the boiler in the factory, and affix their stamp to it in a place where it can readily be found at any future date. Records are also kept by the Bureau of Marine Inspection and Navigation.

IX—SAFETY FACTORS. UNPREDICTABLE STRESS

QUESTION

Why does the safety factor require such a large margin of strength over stress?

ANSWER

The safety factor, or ratio of strength over stress, is the number of times the calculated load that would rupture the part. The minimum factor is 4, so that approximately 4 times working pressure would rupture the plate. There are other boiler parts that take higher factors.

There are many reasons for this large factor. There are several stresses which cannot be calculated accurately, so that liberal allowances and estimates are made. There are many stresses which cannot be predicted in advance and included in the calculations. Among these are: stresses locked up in fabrication and unrelieved; stresses from rapid or unequal temperature changes; stresses from piping and attachments; stresses from movement of ship; shock stresses, such as opening and closing of safety valve; and blows of any kind which must be endured during the life of the boiler.

Also included in the safety factor must be weakening of the plate by small cracks from any cause, or thinning of the plate from corrosion. There must be strength in the plates for emergency patches. And so on, the list of unknowns could be extended.

The stress from temperature changes may be enormous, as real and large changes of dimensions of parts take place. Much of the refined technique in boiler design is the allowance of relative movement of parts to relieve temperature stress.

Our next article will discuss four more cardinal points of boiler design, in which the difficult question of boiler rating will be covered.

Special Note: Our November issue, in discussing furnaces, was worded in such a way as to infer that the forced draft pressure of a modern boiler was more than a furnace should stand, and some induced draft fans should always be used. This is in error. Boilers on the Maritime Commission ships have only forced draft fans blowing directly into the furnace with no fans in the stack. This means that the pressure to force hot gases through boiler and following heat exchangers is on the walls of the furnace, which must be airtight and strong enough to resist the pressure. All openings must be pressure-tight. Thus the 15 to 24 inches of water (approximately one pound per sq. inch) pressure on the interior of the furnace is a great change from the old boilers, where furnace doors were opened for inspection or firing.

Engineers' Licenses for November

SAN FRANCISCO

Name and Grade	Class	Condition
R. Barker, Chief	SS, any GT	RG
A. Reid, Chief	SS, any GT	RG
W. B. Gibson, Chief	SS, any GT	RG
J. N. Mosher, Chief	SS, any GT	RG
W. F. Benson, Chief	SS, any GT	RG
H. Andersen, Chief	SS, any GT	RG
J. Griffin, Chief	SS, any GT	RG
S. B. Kelton, Chief	SS, any GT	RG
L. H. Wallace, Chief	SS, any GT	RG
W. R. Miller, 1st Asst.	SS, any GT	RG
J. F. Doyle, 1st Asst.	SS, any GT	RG
W. H. Secrest, 2nd Asst.	SS, any GT	RG
F. G. Dorego, 2nd Asst.	SS, any GT	RG
R. R. Walters, 2nd Asst.	SS, any GT	O
J. H. Valentine, 2nd Asst.	SS, any GT	O
W. L. Voigt, 2nd Asst.	SS, any GT	O
F. T. Roche, 2nd Asst.	SS, any GT	O
G. K. Wood, 3d Asst.	SS, any GT	O
W. G. Smith, 3d Asst.	SS, any GT	O
I. J. Allen, 3d Asst.	SS, any GT	O
R. H. Crenshaw, 3d Asst.	SS, any GT	O
L. Eaton, 3d Asst.	SS, any GT	O
H. L. Rodener, 3d Asst.	SS. any GT	O
R. H. Ramsay, Chief	MS, any GT	RG
W. F. Quigg, Chief	MS, any GT	O
P. T. Martin, Chief	MS, any GT	O
F. E. Stallman, Chief	MS, any GT	O
W. A. Ferron, Chief	MS, any GT	O
R. W. Graham, Chief	MS, any GT	O
J. N. Mosher, Chief	MS, any GT	O
J. Griffin, Chief	MS, any GT	O
JUNEAU		
H. R. Zehrung, 2nd Asst.	MS, any GT	RG
SAN PEDRO		
J. R. Shafer, Chief	SS, any GT	RG
H. L. Tucker, 1st Asst.	SS, any GT	RG
PORTLAND		
J. H. Weed, 2nd Asst.	SS, any GT	O
V. J. Nelson, 1st Asst.	SS, any GT	RG
SEATTLE		
A. E. Dye, 2nd Asst.	SS, any GT	RG
J. W. Clark, 2nd Asst.	MS, any GT	RG
J. H. Schulke, Chief	MS, any GT	O
V. B. Logan, Chief	MS, any GT	O

Abbreviations: SS is steamer; MS is motorship; GT is gross tonnage; O is original license; RG is raise of grade. All of these licenses are for ocean service.

QUESTION FROM SHIP

QUESTION

Will you please work this problem for me? What is the thickness of a steel pipe which has a mean diameter of 6 inches and on which we carry a working pressure of 550 lbs.? The pipe has a fiber stress of 6750.

J. H. Brooklyn, N. Y.

ANSWER

The question is not a proper one, as the diameter should not be stated as "mean" diameter. A fair question would state the outside diameter, as this is the one used in the G. R. R. formula. See page 103, formula 62, of G. R. R., brown 51st Supplement, thickness of Class I main steam piping.

$$T=\frac{WD+C}{2S}$$

T=thickness in inches

W=working pressure lbs. per sq. in.

D=actual external diameter of pipe, inches.

C=constant of .1 for steel pipe, a factor added to computed thickness to allow for weakening by bends or scars.

S=allowable fiber stress, pounds per sq. in. cross section of steel.

$$T=\frac{550\times 6}{2\times 6750}+.1=.2445+.1=.3445$$

inches wall thickness.

Above is worked on assumption that diameter given is external. If mean diameter or internal diameter is given, it will require a very complex operation in mathematics to get a theoretically correct solution, but we may get a very satisfactory solution by recalculating the problem again, using the above wall thickness to get the external diameter. Thus, if wall is assumed .3445 inches, then external diameter would be mean diameter plus this figure, or 6.3445 inches. Solving again:

$$T=\frac{550\times 6.3445}{2\times 6750}+.1$$

$$T=.258+.1$$

$$T=.358 \text{ inches.}$$

A third solution, using the new wall thickness, would give a yet more accurate answer, but the above should be taken as thoroughly satisfactory. Above solutions are by slide rule, a fact to be remembered if anyone attempts to check them by longhand calculations. Slide rule calculations always leave the fourth figure and beyond from the left in some doubt.

Pacific
NORTHWEST MARINE REVIEW

by D. L. Pratt

Puget Sound Shipbuilding

New Harbor Island Yard. Thirty million more dollars were added to the backlog of shipbuilding orders in the Pacific Northwest by the awarding of additional contracts for five destroyers to the twenty which the Seattle-Tacoma Shipbuilding Corp. already had on hand. These destroyers will be of approximately 1630 tons each. They are of a type for which the Navy had already contracted with the yard for five. The other fifteen vessels on order are of the 2100-ton class, which brings the total of Navy orders for the Seattle division of this firm to a total of about $172,000,000.

According to R. J. Lamont, president, the new order will probably call for additional outfitting facilities at the $4,600,000 plant now under construction on Harbor Island, but probably no addition to the number of shipways. The present plans call for five shipways each 400 feet long and 109 feet wide, extending into Elliot Bay.

Hundreds of men, working day and night shifts, are engaged in rushing the thirty-acre plant to completion, with the force of workmen being increased daily. Unless some unforeseen delay occurs, it is hoped that the plant will be far enough along to lay the first keel in February, approximately four months after construction was started. This would be a record for shipyard building not even exceeded in the World War days.

Serious delay was threatened in early December by a strike that closed down most of the Puget Sound lumber mills. Had it continued, it is possible that work on the yard might have had to be shut down entirely, as wood construction is being generally employed to conserve steel for other purposes. At the time this is written, however, Government mediation has resulted in many of the mills being reopened, and it is probable that all will be operating in the near future, as vast amounts of lumber are needed not only for shipyards but also for the building of army barracks and other defense work.

In addition to the five 400-foot shipways mentioned, the Seattle-Tacoma plant No. 2 will include an assembly bay 470 x 90 feet; fabricating shop 275 x 152 feet; a layout bay 275 x 60 feet, served by an open craneway extending 225 feet towards the East waterway, and another craneway extending 200 feet west. There will also be a machine shop 175 x 150 feet, a storage warehouse 260 x 150 feet, a paint shop 100 x 50 feet, a mold loft 260 x 130 feet, and a hospital and restaurant.

Seattle-Tacoma Shipbuilding Company's plant No. 1 at Tacoma, which is working on about $22,000,000 in contracts for new ships awarded by the Maritime Commission, added a third chapter to its annals on November 29 when it launched another of the $2,125,000 C-1 type modern cargo vessels, the Cape Cleare. Named after a well-known Alaska headland, the new vessel was christened by Mrs. William E. Boeing, wife of the founder of the Boeing Aircraft Co. of Seattle, following rites attended by a small group of civic dignitaries. The Cape Cleare is a 415-foot vessel to be propelled by diesel power, as are her two sister ships, Cape Alava and Cape Flattery, already off the ways. There are to be five of these vessels in all, in addition to six of the C-3 type, which will be almost 1,000 gross tons larger in size. Trial voyage and speed tests of the Cape Alava are scheduled for January, and the keel of a fifth ship of the same type has already been laid.

Lake Washington Yard. First launching of the four submarine net tenders that are being built by the Lake Washington Shipyards at Houghton, across the lake from Seattle, is hoped to be accomplished during January. This yard also has under contract the construction of the new Coast Goedetic Survey vessel Pathfinder, and of six seaplane tenders, and, according to Charles A. Burckhardt, president, a new yard construction program is to be pushed immediately to greatly enlarge the firm's facilities to handle this and other new work which may develop. Paul E. Voinot, vice president, has recently been in Washington, and according to reports from the Capitol, a federal allocation may be made for this plant expansion, although this has not yet been confirmed locally at time this was written.

A contract was awarded on December 13 to the Lake Washington Shipyards for 4,000 baulk tanks, used in the laying of anti-submarine nets, at a cost of $1,800,000. The yard has been engaged on a previous order for these tanks for some time. Recently the National Steel Construction Co. of Seattle also received an order for $892,800 worth of them. The tanks are said to be 10 feet long, 3½ feet wide and 3½ feet deep, and are of wood and metal construction.

Puget Sound Transportation

New Ferries. With the intention of maintaining fast express car and passenger service between Seattle and Bremerton, site of the Puget Sound Navy Yard, the Puget Sound Navigation Co., generally known as the Black Ball Line, announces that it will immediately proceed with the remodeling and repowering of the Fresno and Santa Rosa, two of the six ferries purchased recently by the company at San Francisco. The sum of $600,000, or nearly twice what the company paid for all six of the craft, will be spent in placing these vessels among the four fastest ferries on the Coast, if not in the country. The other two fast boats, the Kalakala and the Chippewa, are already operated by the Black Ball Line on the Seattle-Bremerton run, and are considered the speediest of their type on either coast. Remodeling work on the Fresno and Santa Rosa will be carried out at the Winslow Marine Shipbuilding Co. plant at Winslow, on Bainbridge Island, across the Sound from Seattle. Alterations to the ferries will provide accommodations for 1500 passengers, and car capacity will be stepped up to ninety. Present diesel-electric plants will be discarded, and new 2800-hp Busch-Sulzer direct-connected diesels will be installed, giving the boats an estimated speed of 17½ knots.

Owing to the great expansion and tremendous shipbuilding program of the Puget Sound Navy Yards, where about ten thousand workers are now employed, travel between Seattle and Bremerton has been so greatly accentuated that the Black Ball Line has been compelled to augment the service of the Kalakala and the Chippewa with regular sailings of the former San Francisco Golden Gate ferries, now known as the Kehlokan and the Klahanee, borrowed from two other routes on the Sound. As soon as the Fresno and Santa Rosa are remodeled, they will take the place of the latter two boats, which will probably be returned to their old routes, for which their speed and capacity are sufficient. The Bremerton run is longer and has heavier travel, and therefore requires the larger and faster vessels. The Fresno and Santa Rosa, with their enlarged capacity and increased speed, running opposite the Chippewa and Kalakala, will make possible a schedule of sailings every 35 minutes, and are the company's answer to the problem of meeting the growing transportation needs occasioned by the wartime emergency.

Work of reconditioning the Redwood Empire and Lake Tahoe, two more of the boats recently purchased, at an expense of about $40,000 each, is also going forward so as to have the boats ready for increased summer travel on the company's other numerous routes. Two more boats, the Stockton and the Mendocino, still remain on San Francisco Bay, and probably will not be moved north until weather conditions are more favorable.

Engines for the Fresno and Santa Rosa will be delivered in Seattle about February 15, and the two boats should be ready to go on the Navy Yard run by May 1.

Port Improvements

Army Supply Base. Made necessary by the immense expansion of the Army in this area under the National Defense Program, a huge waterfront supply base at Seattle is to be created on the south Seattle waterfront at a cost of over a million dollars. First step toward this development was taken on November 21, when a contract for purchase was taken on the property owned by Pacific Terminals, Inc. This site includes 21 acres of waterfront, and lies between South Alaskan Way and Elliot Bay, extending from Atlantic south to Massachusetts Street. Purchase price was $793,000, and although the deal is subject to the approval of the bondholders, of which there are about 700 in the Northwest, no difficulty was anticipated in securing their approval. In addition to the purchase price, several hundred thousand dollars will be spent in alteration and new construction to fit the property for the army's needs as a great supply base and shipping terminal for transports. Although there are two wharves and other outbuildings on the site, new warehouses and other structures must be built and existing wharves remodeled. The property involved in the sale passed into the hands of the bondholders a few years ago when the Pacific Steamship Co., of which Pacific Terminals, Inc., is a subsidiary, was in financial difficulties. One of the present wharves is under lease to the Port of Seattle, the other to the Olympic Steamship Co. Among the buildings included in the sale is the old Pacific Steamship Co. terminal, one of the finest structures of its kind on the Coast when built, from which all of the coastwise passenger boats of that company formerly departed for California. Under the contract, the Army will take possession of the property as of December 31, and construction of the new base will proceed without delay.

Navy Yard Pier. Further expanding the facilities of the Puget Sound Navy Yard, a contract was let in November for the construction of a new $2,000,000 pier. This pier will be 1400 feet long, of reinforced concrete construction, and will be located between the new $4,500,000 graving dock, now ready for dedication, and a $3,200,000 cruiser dock under construction. The work will be carried out on a cost-plus basis by the Puget Sound Bridge & Dredging Co., and Rumsey & Co., both of Seattle. Funds were approved in November by the Navy department and the Bureau of Budget. Commander R. E. Thomas, public works officer of the yard, will supervise the work, which will begin immediately.

Seattle contracting firms are also preparing to bid upon the million-dollar improvement program planned by the Navy Department for the naval torpedo station at Keysport, near Bremerton, where an expansion similar to that at the Navy yard, but on a smaller scale, has been in progress for some months.

Northwest Shorts

Westinghouse Consolidates. Consolidation of all Seattle area activities of the engineering, sales and treasury departments of the Westinghouse Electric & Manufacturing Co., and the Westinghouse Lamp Division, in the Westinghouse Building at 3451 E. Marginal Way, was announced on December 20 by K. L. Howe, Seattle sales manager for the company.

The move, which was made on that date, provides, for those departments and their personnel, several thousand additional square feet of space as compared with offices occupied during the past few years in the Lloyd Building. The entire office area in the new quarters has been modernized, redecorated and relighted.

Seattle headquarters and warehouse facilities of the Westinghouse Electric Supply Co. and the Merchandising Division of the manufacturing company continue in Westinghouse Electric & Supply Company's new building at 1051 First Avenue, South, which they have occupied this past year.

Foster C. Gibson, popular Northwest manager for the Edison Storage Battery Co., made a good recovery after a serious operation at Mayor Brothers Clinic, Rochester, Minnesota, and was home at Seattle for Christmas with his family.

To expedite movement of cargo through Northwest ports during the present emergency, a defense committee within the Northwest Terminal Association has been recently set up. The members of the committee are: **Col. W. C. Bickford,** general manager of the Port of Seattle; **H. W. Hall,** East Waterway Dock & Warehouse Co.; **G. W. Albin,** Ames Terminal; **George W. Osgood,** manager of the Port of Tacoma; and **Sam Stocking,** the Shaffer Terminals, Tacoma. Col. Bickford is chairman of the committee, and its work will be cleared through the office of **J. R. West,** executive secretary of the Northwest Marine Terminal Association, 1301 Alaska Building, Seattle.

Shipments of Alaskan products south during November, including gold and silver, topped five and a half million dollars, and scored a gain of 100 per cent over November of 1939.

(Page 100, please)

Pipe Bending

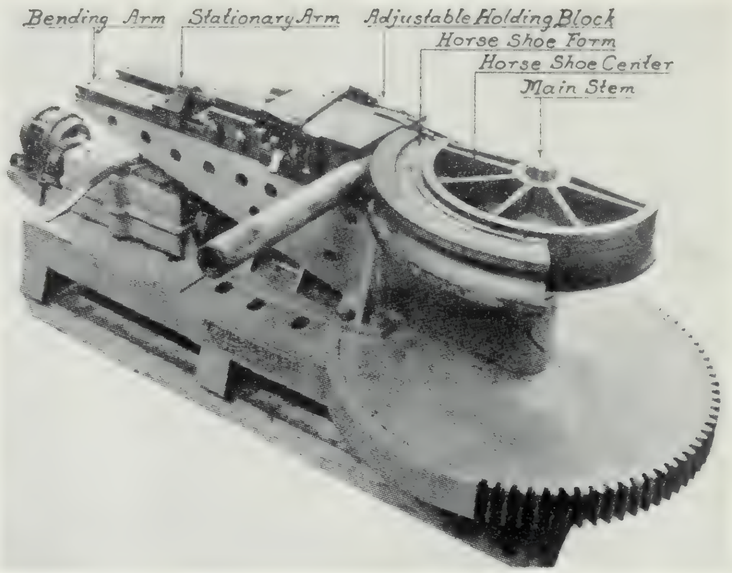
For Ships, and a Pipe Bending Machine

One of the problems facing the modern shipbuilder is the installation of pipes and tubes for the power, sanitary, culinary, heating, fire-protection and electric services required by modern conditions of life on shipboard. During the big shipbuilding effort of 1917-1922, the shipbuilders of Pacific Coast were ably served in solving this problem by a San Francisco firm—the U. S. Pipe Bending Company. This firm owns the patents controlling the U. S. Pipe Bending Machine, and the facility with which these machines turned out all types of bends in pipes of various material in sizes small and large was of great assistance to the shipbuilders in making the remarkable construction records achieved on the Pacific Coast at that time.

After the big shipbuilding boom was over, U. S. Pipe Bending Company branched out into industrial work and into the manufacture and sale of its own machine.

These machines are simple, sturdy, effective and economical. One of the first customers for a machine was Bethlehem Steel in 1925. Today Bethlehem has seven on order and in process of manufacture. Standard Oil Company of California, and the U. S. Navy are return customers. In fact, these machines have been shipped from San Francisco to China, Persia, Russia, England, the West Indies and other far-off regions, and will be found in satisfactory use wherever they have gone.

These machines are built in capacities up to 24-inch pipe diameter. The machines built in 1918 are still in active service and turning out standard product. In fact, for service periods ranging up to twenty-two years, not one U. S. Pipe Bending Machine has ever had a stoppage of performance, a record which gives a solid foundation to the bold statement of this firm that these are "the best pipe bending machines ever made."



U. S. Pipe Bending Machine with work in place

The U. S. Pipe Bending Company, in order better to serve its many customers, and at the same time take care of the National Defense demand on its services, has moved to new and larger premises on First Street between Howard and Folsom Streets, San Francisco. Here, with a floor area of 30,000 square feet, this firm has complete equipment to handle everything in its line or lines.

The principal line of a pipe bending firm naturally is the bending of pipe. However, machines for pipe bending can be used for bending sections other than the hollow cylinder, and U. S. Pipe Bending Company soon found many outlets for its energies other than pipe. In fact, just about every difficult bending problem was brought to this firm. Along with bending problems came the problems of joining bent sections to make up various structural members and coils.

So during the past twenty years this firm and its machines have been producing bends, coils, rings and spirals not only in pipe but also in flat bars, angle bars, H-beams and I-beams. This experience includes all these forms not only in mild steel but also in alloy steels, stainless steels, Monel and all non-ferrous metals. Their ability to make bends exactly to specifications over this range of metals and shapes has led naturally to a demand that they install their bends in many finished fabrication, and this demand induced an exhaustive study of the welding technique best adapted to various materials and various forms.

As a result of all this, few firms are as well prepared to undertake difficult problems in the fabrication of structures involving complicated bends. The U. S. Pipe Bending Company will undoubtedly be of great service to the newly-awakened shipbuilding industry of the Pacific Coast.

Errata

In the December, 1940, issue, on page 59, we published a "set of minimum standards for safe conditions aboard ship, presented by a committee of the Marine Section, National Safety Council." This was correct as far as it went, but it did not go far enough. We are now informed by F. E. Ames, manager, Safety Department of Lykes Bros. S. S. Co., and chairman of above committee, that these minimum standards were solely the work of John Wright, manager, Claims and Insurance, American Export Lines.

Congratulations, Mr. Wright, on an excellent piece of work!

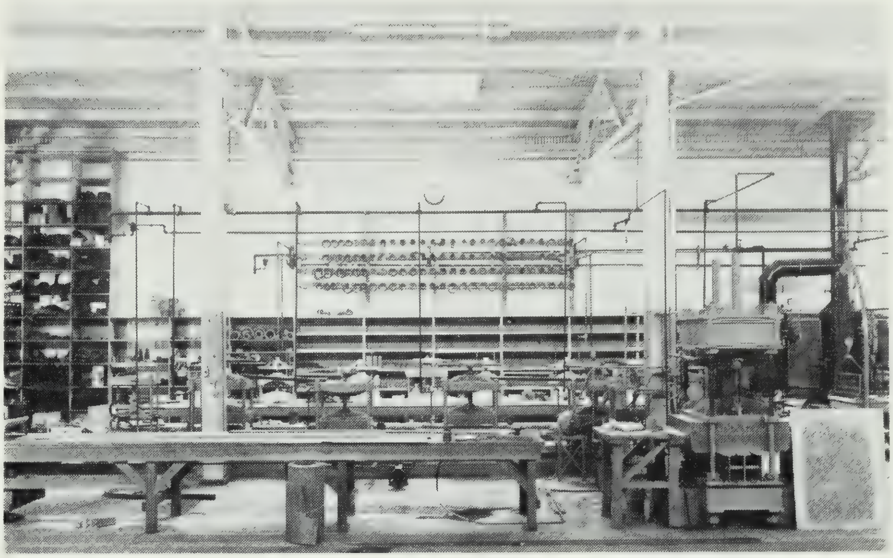
New Home for Gasket Shop and Standard Rubber Company

The Hercules Equipment & Rubber Company announces the removal of the Gasket Shop and the Standard Rubber Company to 435 Brannan Street, where greatly enlarged facilities for the manufacture of gaskets and molded rubber goods are available.

These two divisions, The Standard Rubber Company and the Gasket Shop, will continue to operate under their own names, as in the past, but will function as one unit under the control of the Hercules Equipment & Rubber Company.

The new factory has a ground floor space of 30,000 square feet, and is equipped to handle any kind of specialty in the manufacture of gaskets. New machinery and equipment has been installed, and with its large stock of molds and gasket dies, the new plant is now one of the most complete units in the West for manufacturing gaskets and molded rubber goods.

Among the joint sealers manufactured and carried in stock by the company are: solid cord and sponge rubber drum head gaskets; drum plug gaskets in all materials and combinations of materials; spiral wound metal and asbestos gaskets; standard and full-faced gaskets in rubber, asbestos and vegetable fiber.



Molded Rubber Goods Department ↑

The Gasket Department ↓

Stocks are maintained of sheet cork, felt, compressed asbestos, rubber of all kinds, vegetable fiber, Neoprene and other synthetics.

The Hercules Equipment & Rubber Company are distributors of a complete line of packings, gaskets and other products. Among the manufacturers represented are: The B. F. Goodrich Company, mechanical rubber goods; The Belmont Packing & Rubber Company, packings; Azor Corporation, spiral wound gaskets; Durabla Manufacturing Company, packing and valves; Melrath Supply & Gasket Company, Inc., gaskets; The Chardon Rubber Company, tube machine products; Minnesota Mining and Manufacturing Company, vegetable fiber packing; The France Packing Company, metal packings; Greene, Tweed & Company, Palmetto packings; D. B. Smith & Company, Smith-Indian fire pumps; Wil-X Mfg. Corporation, fire extinguishers; Eco Engineering Company, Eco gearless marine circulating pumps; The Toledo Timer Company, variable speed transmissions; The Q-P Signal Company, Q-P self-setting packing; Rhodes Metallic Packing Company, metallic packing; The Ohio Pattern Works & Foundry Company, valves, fittings and assemblies; and the Philadelphia Valve Company, tank truck hose reels, valves and fittings.

On the Ways -
SHIPS IN THE MAKING

LATEST NEWS FROM AMERICAN SHIPYARDS

Commission Shipbuilding in 1940

The Maritime Commission has released the following summary of its shipbuilding activities for the calendar year 1940:

During 1940 the number of new merchant ships built or building under the Maritime Commission program reached 179, at a contract price of over $450,000,000. Of this number, 91 have been launched and 61 delivered. These 179 vessels are the most efficient naval auxiliaries that can be designed. The Navy has either acquired or will shortly acquire 24. All of them are built according to designs approved by the Navy and determined with Navy needs in mind. Twelve of the new auxiliaries are 19-knot National Defense tankers, the fastest of which there is any reliable record. These tankers, the majority of them already serving the Navy, have a total capacity of 72,000,000 gallons of fuel oil. Of the others, eight are C-2 type freighters which can make better than 17 knots, and will be used by the Navy as ammunition and cargo ships. Four are C-3 type freighters which have operated at 19 knots and are to be used as submarine and seaplane tenders. The Commission has acquired 15 additional auxiliaries for the Navy and ten merchant ships for the Army. Two of the C-2 type ships now being built on the Pacific Coast will become Army transports. Orders will soon be placed for two marine transports and five small gasoline tankers designed by the Commission and to be built for the Navy. The Commission likewise plans to order two 35,000-ton fast passenger vessels with a speed of over 24 knots. With stacks on the starboard side, the 759-ton vessels will be capable of quick conversion into aircraft carriers.

Among the most important vessel completions of the year were those of the President Jackson and President Monroe, two of a group of seven round-the-world passenger ships for the American President Lines. Designed by Commission architects and engineers, they will circumnavigate the globe in 98 days.

With deliveries of Maritime Commission ships taking place at the rate of one a week, the United States is rapidly acquiring a substantial number of fast and efficient cargo and cargo-passenger ships to satisfy the needs of commerce and of defense.

COMPARATIVE SUMMARY STATEMENT OF SHIPBUILDING IN PRIVATE SHIPYARDS OF THE UNITED STATES

(Steel Vessels Each of 1000 Gross Tons or Over)

	1939		1940	
	Number	Tons*	Number	Tons*
Under Construction on January 1				
Commercial Vessels	59	538,100	141	1,122,659
Naval Vessels	38	209,620	36	241,725
Vessels Contracted for During the Year				
Commercial Vessels	108	833,355	95	836,440
Naval Vessels	14	64,845	284	1,454,375
Vessels Launched During the Year				
Commercial Vessels	40	335,200	68	541,505
Naval Vessels	15	50,770	18	68,065
Vessels Delivered During the Year				
Commercial Vessels	28	251,900	51	449,659
Naval Vessels	16	32,740	18	63,080

The 51 commercial ships delivered during 1940 included 17 tankers of the latest type American design and construction; 28 of the new, higher speed cargo ships; 5 combination passenger and cargo vessels; and 1 passenger vessel, the S. S. America.

	1939		1940	
	Number	Tons*	Number	Tons*
Vessels under construction December 31				
Commercial Vessels	#139	1,119,555	185	1,509,440
Naval Vessels	36	241,725	302	1,633,020

(*)—Tons: *Gross* for Commercial Vessels. *Displacement* for Naval Vessels.

(#)—Changes from last year's report due to later information. From January 2 release of National Council of American Shipbuilders.

Two Launchings on Shortest Day

Two new ships in the Maritime Commission's construction program were launched on December 21—one in Pascagoula, Mississippi, and one in Sparrows Point, Maryland. One is a Commission-designed C-3 cargo type, and the other is a Commission-designed C-1 cargo type. These vessels are:

S. S. Mormacpenn (second vessel to be so named; first was acquired by the Navy and renamed U. S. S. Griffin), C-3, approximately 7680 gross tons. She was launched at 9:00 a.m. C.S.T., at the yard of the Ingalls Shipbuilding Corp., Pascagoula, Mississippi, under the sponsorship of Mrs. Carl F. Farbach, wife of the General Counsel of the Maritime Commission, and is scheduled for the American Republics Line service to South America.

S. S. Thompson Lykes, C-1, approximately 6900 gross tons, was launched at 11:15 a.m., E.S.T., at the yard of the Bethlehem Steel Company, Sparrows Point, Maryland, under the sponsorship of Miss Ada Belle Lykes, daughter of Frederick Lykes, president of Lykes Bros., Inc., of Tampa, Florida, and is scheduled for the service of the Lykes Bros. Steamship Co. from Gulf ports to Far East ports.

Bids Invited for Twin-Screw Tankers

The Maritime Commission on Friday, December 13, announced that it had invited bids for construction of five twin-screw, diesel-propelled gasoline tankers for the United States Navy.

The vessels will be 309 feet 6 inches overall, with a designed speed of 14 knots and of approximately 2300 tons deadweight.

Bids will be opened at 12:15 p.m., E.S.T., January 9, 1941, in Room 7856, Department of Commerce Building, Washington, D. C.

Consolidated Gets Two Transports

The Maritime Commission on December 23 announced receipt of two bids for construction of two marine transports, as follows:

Pusey & Jones, Wilmington, Delaware

For each of two, adjusted price, $7,268,540.

Time specified for construction: 680 days for the first ship; 780 days for the second.

Consolidated Steel Corp., Ltd., Los Angeles, California

For each of two, fixed price, $4,575,000; adjusted price, $4,375,000.

Time specified for construction: 620 days for the first ship; 660 for the second.

On January 2 the Commission announced that this contract for two ships was awarded to Consolidated Steel Corp. on its adjusted price of $4,375,000 for each ship.

Bids Called for C-2 Vessels

The Maritime Commission announced on December 17 that bids have been invited for construction of a group of C-2 type, single-screw cargo vessels. Bids may be entered by a contractor on one to six vessels with either diesel or steam propulsion.

The vessels will be 459 feet overall, of approximately 6,000 gross tons, approximately 9600 deadweight tons, with a designed speed of 15½ knots, and accommodations for eight passengers.

Bids will be opened on January 6, 1941, at 12:15 p.m., E.S.T., in Room 7856, Department of Commerce Building, Washington, D. C,

On December 19 the Maritime Commission announced that bids have been invited for construction of another group of C-2 type, single-screw cargo vessels.

Bids may be entered by a contractor on one to four vessels with diesel propulsion.

Bids will be opened on January 13, 1941, at 12:15 p.m., E.S.T., in Room 7856, Department of Commerce Building, Washington, D. C.

Federal to Build C-2

On December 10 the Maritime Commission announced the receipt of a bid from Federal Shipbuilding and Dry Dock Company, Kearny, New Jersey, for the construction of one C-2 type, steam-propelled, single-screw cargo vessel to be built for the Grace Line, Inc., New York City. On a fixed price basis, the bid was $2,475,000; and on an adjusted price basis it was $2,250,000.

The bidder specified in submitting the bid that in view of the unusual and emergency conditions prevailing at this time, it would be necessary to extend the completion dates of certain ships now under construction by the company for the Commission.

This vessel will replace the Grace Line's S. S. Stag Hound, which was delivered to the Navy Department on December 20, 1940.

Two Ore Carriers to Be Built

On December 23 A. H. Ferbert, president of the Pittsburgh Steamship Co., a subsidiary of United States Steel Corp., announced that his firm will build two large ore carriers to go into service in 1942. Pittsburgh Steamship Co. now operates sixty-eight steamers and two barges.

The last ore carriers constructed on the Great Lakes were the four 600-foot vessels launched by the Pittsburgh Steamship Co. in the fall of 1937 and placed in service in 1938.

C-3 S. S. Mormacpenn sliding off ways at Ingalls yard, Pascagoula, Mississippi

Federal Launches Fifth C-1

The Federal Shipbuilding and Dry Dock Company, subsidiary of the United States Steel Corporation, on December 20 launched the last in a series of five C-1 type cargo vessels for the United States Maritime Commission.

The ship was christened the S.S. John Lykes by Mrs. Guy R. Webb of Lake Charles, Louisiana. The sponsor is the daughter of John W. Lykes, a director of Lykes Brothers, Incorporated, for whom the ship is named.

The contract for the five C-1 type cargo vessels was awarded to Federal in August, 1939. The vessels, to be propelled by high-pressure steam turbines, will be 416 feet in length, 60 feet in breadth, and 37 feet in depth, with a gross tonnage of 6750. With the completion of this ship, all five of the vessels constructed by Federal under this contract will be in the service of the Lykes Brothers Steamship Company.

Newport News Delivers President Monroe

The Maritime Commission announced that the S.S. President Monroe, the second C-3 passenger and cargo vessel to be placed in service, was delivered on Thursday, December 19, at the yard of the Newport News Shipbuilding and Dry Dock Company, Newport News, Virginia, to the American President Lines for its round-the-world service.

The President Monroe is one of a fleet of seven sister ships being built for the round-the-world service of the American President Lines. It was designed by the Maritime Commission, and is the largest of the three major types of vessels being constructed as merchant marine replacements. Like its sister ship, the President Jackson, it will have accommodations for 98 passengers. Overall length is 492 feet, breadth 69 feet, 6 inches; designed speed 16½ knots; 9300 gross tons.

The S.S. President Monroe left on its first round-the-world voyage on December 28 from New York and will return to that port on March 28. The President Jackson is at present en route from Manila, P. I., to Singapore, Straits Settlements, on her first world cruise.

Bethlehem Launches Robin Line Steamer

On December 7 the Sparrows Point Yard of the Shipbuilding Division, Bethlehem Steel Co., launched the S.S. Robin Doncaster, one of six sister cargo steamers building for Robin Line service of the Seas Shipping Company, Inc., in the New York-Baltimore to South and East African ports in the Cape Town-Mombassa range.

These steamers have a dead capacity of about 9700 tons, a displacement of 15,084, and a cargo space of about 600,000 cubic feet, of which 16,800 cubic feet will be refrigerated. Their principal dimensions are:

Length overall	479′ 8″
Length B. P.	465′ 0″
Beam	66′ 0″
Depth	43′ 0″
Depth 2nd deck	34′ 0″
Draft	27′ 0″

Speed on 73 per cent full power, 15½ knots.

They were especially designed for the South African trade by George Sharp, naval architect.

Propulsion machinery consists of cross-compound turbines taking steam at 450 psi and 750° F. temperature from two water tube boilers, and driving a single four-blade propeller through double-reduction mechanical gears. This machinery develops 6300 shp at 85 rpm of the propeller shaft. It is estimated that the last of the six vessels will be delivered in October of this year.

Moore-McCormack Lines Finishes One, Launches Two

On December 18 the Sun Shipbuilding & Dry Dock Co. launched the passenger and cargo motorship Rio Parana for the New York-East Coast South America service of the Moore-McCormack Lines. Rio Parana is the second in a series of four modified C-3 motorships building at the Sun Yard for this service.

These four motorships will each have first class passenger accommodations for 197 passengers, and will be unique among passenger ships as being the first ever built with air conditioning in every passenger stateroom as well as in the public rooms.

On December 21 the Ingalls Shipbuilding Company of Pascagoula, Mississippi, launched a C-3 cargo steamer, which was christened Mormacpenn by Mrs. Carl F. Farbach, wife of the General Counsel of the U. S. Maritime Commission. This ship is the second Moore-McCormack vessel during the past year to be christened by this name. The first Mormacpenn was taken over by the Navy Department recently.

The Mormacpenn is the second ship in a series of three all-welded steel C-3 cargo vessels being built for the Moore-McCormack Lines at the Ingalls Shipbuilding Company's yard. The first of this series, christened Mormacmoon, was delivered on December 30.

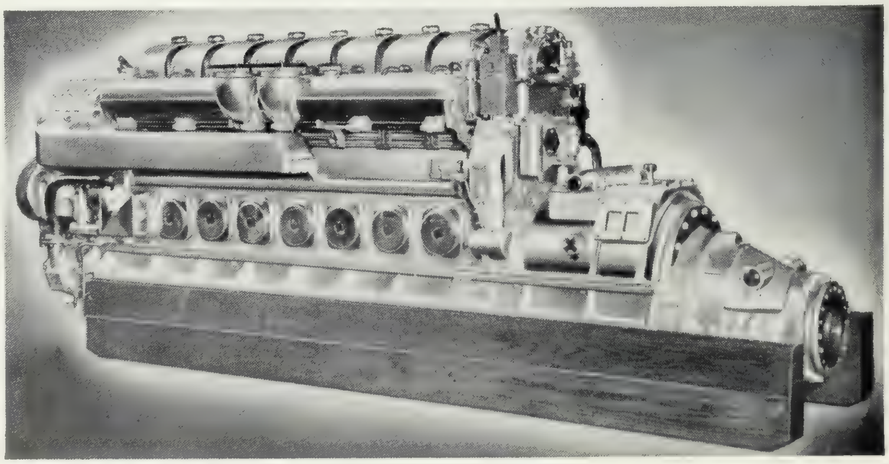
A G-M Streamlined Diesel

General Motors will exhibit a truly streamlined diesel engine at the New York Motor Boat Show, January 10 to 18, according to George W. Codrington, president of the Cleveland Diesel Engine Division, General Motors Corporation. This streamlined engine is an 8-cylinder, in line, 2-cycle diesel equipped with reverse gear and reduction gear.

"This engine," Mr. Codrington said, "exemplifies General Motors' complete versatile line of 2-cycle diesel engines—either for direct or electric drive. In addition, General Motors also will display a model 4-71 40-kw generator set for auxiliary marine power.

"Reliability and versatility of General Motors' diesel engines have been attested to by the fact that the United States Navy and other branches of the Government's armed services are specifying them in large quantities. Our Cleveland factory is now busy producing nearly $90,000,000 worth of G. M. diesel engines for the Government.

"The Government also has purchased, or has taken over, many yachts and workboats powered by G. M. diesel and Winton diesel engines, because such boats have proved their high dependability."



The eight-cylinder G-M streamlined diesel with reduction and reverse gear

Some Effects of War on Marine Insurance

by Marshall Levis

Vice President, Marsh & McLennan

War affects ship operations and vitally influences insurance on hulls and cargoes. Underwriters take the position that their marine risks are substantially increased, due to vessels traveling in convoy, running without lights, restrictions on radio communications and by other precautions taken to prevent discovery by those whose intent it might be to prevent vessels or cargoes from reaching their destinations. Underwriters believe that during war times they must anticipate deferred and increased costs of repairs, and the additional possibility of more accidents due to speeding up of operations to take care of an expanding volume of business. Therefore marine rates on vessels frequently are higher during war times.

Definition of War Peril Loss

It has often been difficult to determine whether a loss was occasioned by a marine or a war peril. In order to establish that a loss was due to a "consequence of hostilities or warlike operations" it is necessary to show, in the first place, that hostilities or warlike operations were actually being engaged in, and, secondly, that a consequence of such operations was the dominant or effective cause of the loss. The references to "hostilities" and "warlike operations" in marine and war risk policies do not apply to all consequences of the existence of a state of war. The courts have stated that the word "hostilities," as used in insurance policies, does not mean "the existence of a state of war," but means "*acts* of hostility" or "operations of hostility," and further, that "operation *in* war and operations *of* war are not necessarily the same thing."

Examples

Examples of losses consequent on hostilities are loss by enemy gunfire, or airplanes, or torpedo; through the striking of mines, whether moored or drifting; or through explosion and fire caused by bombs placed on board a vessel by an enemy subject domiciled abroad.

What may constitute a "warlike operation" is more difficult to define. The House of Lords has said that, "during the war almost any movement of the combatant forces in the course of their combatant duties while exercised in the area of war could be included," and "when a war vessel is actually at sea, and is there because she is under orders to go to a particular spot to undertake a warlike operation, whatever its nature may be, she is engaged in that warlike operation, because she is doing that which is necessary to get to the spot where the actual thing is to be done." But everything done by a ship of war or an officer thereof in time of war is not necessarily a warlike operation or the consequence thereof.

A requisitioned steamer fitted out as an ambulance transport, which carried a gun and naval gunners, while proceeding at full speed without lights, came into collision with a merchant ship, which had no masthead lights and dimmed side lights. The ambulance transport was held solely to blame due to negligence in navigation, and the owners from whom she had been requisitioned were entitled to recover her damage under her war risk insurance, on the grounds that the loss was a consequence of a warlike operation.

However, where collision between a vessel on a warlike operation and a merchant vessel on a peaceful voyage has been caused by negligence on the part of the merchant vessel, the courts have decided that it was a marine loss.

Collisions occurring between merchant vessels steaming at night without lights is a marine risk and not a war risk. It is merely a consequence of a peaceful voyage having to be performed under conditions rendered necessary for safety by the existence of a state of war. The fact of merchant vessels steaming at night without lights does not of itself constitute a warlike operation.

Merchant vessels on peaceful voyages while in convoy under armed escort are still continuing the performance of their peaceful duties, but of necessity under altered conditions. The escorting vessels of the convoy are engaged in a warlike operation, the escorted merchant vessels are not. A vessel, while in convoy with other vessels under naval escort, struck an unlighted reef in the Mediterranean and became a total loss. She had been ordered by the naval officer in command of the convoy to take an unusual course to avoid enemy submarine. The court held that sailing in convoy is not of itself a warlike operation, that the stranding was not a consequence of hostilities or warlike operations, and that the loss was one for which the marine risk underwriters were liable. The striking of the reef was not the inevitable or even probable consequence of the order of the commander of the convoy, but was an accidental occurrence.

During the course of a convoy, an escorting vessel was blown up by a mine or a torpedo. Fearing enemy attack, the merchant vessels began to scatter. In the ensuing confusion, one merchant vessel collided with another and sank. It was held that the explosion which caused the escorting vessel to sink was the real cause of the loss of the merchant vessel and the loss was therefore a war risk.

A merchant vessel met with a semi-submerged object which was taken to be a German submarine. The master rammed the object in order to destroy it, and as a result his vessel was damaged and sunk. It was held that whether or not the object was what the master thought it to be, he, honestly believing it to have been a submarine, did the most reasonable thing in attacking it, that his act was a warlike operation or a consequence of hostilities, and that therefore the loss must be borne by the war-risk underwriters.

I shall not attempt to criticize the ruling in any of the cases to which I have re-

MARINE DEPARTMENT
AETNA INSURANCE CO.
QUEEN INSURANCE CO.
MARITIME INSURANCE CO., LTD.
FIDELITY PHENIX FIRE INS. CO.
Commercial Hull Dept.
AUTOMOBILE INS. CO.

MATHEWS & LIVINGSTON
Marine Underwriters
200 BUSH STREET · · · · SAN FRANCISCO
Offices at: Colman Bldg., Seattle · 111 West 7th St., Los Angeles

ferred, nor attempt to reconcile them with each other. Each individual case is governed by the particular circumstances involved. It is apparent that the line is finely drawn between marine and war perils. Underwriters will not commit themselves in advance with respect to their liability for war losses on hypothetical illustrations.

Combination Insurance Coverage

To avoid litigation and assure the most expeditious collection of losses, a shipowner or cargo shipper would naturally insure marine and war risks in the same amounts and identical proportions with the same underwriters. However, it is not always possible, and in the interest of economy, it unfortunately is not always practicable to combine the marine and war risk placings.

Contrast, 1914 and 1940

During the last great war, the placing of war risk insurance was a most difficult matter. For a long time there was little uniformity with respect to rates and conditions. Each underwriting office seemed to have its own ideas and handled its own commitments. This greatly impeded the progress of placing insurance, and made it necessary for insurance brokers to place men in lines for many hours per day in the more important underwriting offices. Frequently one man would stand in line the better part of a day holding his station for a placer from a brokerage office. Obviously such procedure could not work satisfactorily for anyone concerned, especially the shipowner or shipper who was anxious to have his insurance arranged with dispatch.

To meet the present war risk insurance requirements of the shipping industry, underwriters generally have been better prepared than they were at the time of the last major European war. They have endeavored to take advantage of the lessons then learned. The Italian-Ethiopian and Chinese-Japanese wars and the Spanish Civil War also have presented problems which have brought home to insurers the necessity of providing adequate facilities for shipowners and shippers.

Organization of Markets

In times gone by, when aggregate value of ship and cargo ran to lesser figures, and fewer insurance companies were interested in any one risk, there was less organization among the insurance companies. With the rising amounts at risk on one voyage, and the resulting increase in the number of insurance companies involved, a strong trend toward organization in the marine insurance markets of the world has been noticeable. Thus we find the development of syndicates, exchanges and associations, all tending toward the standardization of rates, forms and practices. Without such organizations the larger amounts required on single risks would be difficult to obtain on such short notice as is very often necessary under rapidly changing shipping conditions. Not all insurance companies insuring marine risks are members of each syndicate and association. Certain companies prefer to operate separately and forego the advantages of organized groups in exchange for freedom of action.

American Organization

In the United States, the American Marine Insurance Syndicate, originally organized to write marine insurance on ocean-going tonnage of American ownership, has expanded its facilities to include war risk coverage on our ships. There is additional war risk capacity in the American market in companies not affiliated with the Syndicate. The United States Maritime Commission now has two insurance funds—one in which they will accept a portion of the marine insurance on vessels in which the Commission has a financial interest; the other fund to provide war risk insurance on American vessels should there be insufficient market obtainable through the usual underwriting channels.

Lloyd's Organization

For many years the London insurance market has done an extensive American business. To strengthen their position with respect to this business, Lloyd's set up a trust fund in New York, which, when instituted in August, 1939, amounted to a sum figured actuarily as sufficient to liquidate liabilities under American policies then outstanding. Since that time, the premiums on policies issued at Lloyd's in American dollars and covering American-controlled property have been paid to the trustees, the City Bank Farmers Trust Company, New York. Likewise, the trustees have paid all losses arising under American-dollar policies. The aggregate value of the fund, while naturally enhanced by the addition of new premiums and reduced by the payment of losses, also fluctuates with the market value of the securities. The initial amount deposited was $40,000,000, and is to protect all classes of insurance.

Other British Companies

Some British insurance companies, having felt that their position, from the standpoint of American policyholders, suffered in comparison with that of Lloyd's underwriters since the establishment of Lloyd's trust fund, have likewise recently set up an American trust fund with the Bankers Trust Company of New York in the amount of $10,000,000. The trust differs from the trust established by the London Lloyd's. This trust is for the protection of American insurance or reinsurance written in United States currency through the marine departments of the companies in Great Britain. It is a fixed trust, from which losses will not be paid except in case of an emergency, and to which premiums will not be added. Under the Deed of Trust, the agreement is a joint one, so that each company is guaranteeing not only its own losses but those of its co-members. Claims against Lloyd's and British companies on policies issued in Great Britain must, as heretofore, be passed on by their representatives in London or at some other point which they elect. It has been stated that in event of any suspension in communications with London, arrangements have been made to approve claims on this side of the Atlantic.

The United States Maritime Commission has ruled that insurance on vessels in which the Commission has a financial interest attaching on and after June 22 of this year (1940) must be in either American companies, American branches of foreign companies, Lloyd's, or companies who have funds trusteed in America.

Cargo Insurance

With respect to cargo insurance, after the outbreak of present hostilities underwriters placed a surcharge on the rates for marine risks on cargo to the European war zone to compensate the insurance companies for what they believe to be the additional marine perils placed upon them by war conditions.

(Page 102, please)

PACIFIC MARINE *Reviews*

"The Mariners" Pipe All Hands Aboard for Programs

Plenty of our old shipmates were on deck at the gala Christmas party of the Mariners Club! Chartered for the event was the 365 Club on Market Street, in San Francisco, and the holiday spirit prevailed long into the afternoon when those of us who hanged the last dog on the mizzenmast turned the hall back to Bimbo.

Aiding and abetting the 365 floor show, Stanley Allen's "Marinerettes" put their best feet forward and Dick Glissman took over the emsee's mike bedecked and bewhiskered as dear old Santa. A few well placed pillows helped his characterization from foreshadowing a too "slim Christmas" and we didn't lose a passenger!

Among those who labored effectively for the grand success of the festive affair were Frank Fox, Fletcher Monson, Eddie Macfarlan, Frank DePue and our prexy, Walter Walsh. Some two hundred or more came aboard.

January Program Set

Annual election and business meeting will be held Wed. noon, January 15, 1941, at the St. Julian Restaurant.

Luncheon will be served at 12 noon. The importance of this meeting requires your attendance. Please put this date on your new calendar *now*.

A spectacular movie of "OIL FIRES" will be presented.

We can comment very enthusiastically on the movie mentioned above—as we happen to be familiar with its excellence. The film portrays the valuable work which Standard Oil of California has accomplished in coping with tank fires. It is exceptionally well edited, a superb photographing job, and has the advantage of being projected by explanatory remarks by Fire Prevention Engineer Max Anfenger.

Make your plans for attending Wednesday noon, January 15th. We'll be seeing you!

Election

Official announcement to the membership heralds an important meeting on January 15th at the St. Julien as follows:

To the Members of the Mariners Club of California—

Gentlemen: Your Committee, appointed in accordance with Section 1, Article VIII of our by-laws to nominate officers for the year 1941 recommend and nominate the following:

For President, Capt. A. T. Hunter, For Vice President, Mr. Erik Krag, For Governors (4 to be elected for 3-year terms), Mr. E. J. Macfarlan, Mr. Thomas Short, Mr. Thomas Munro, Mr. C. M. LeCount.

Respectfully submitted,

NOMINATING COMMITTEE, Winslow D. Conn, Chairman.

Lt. Col. Ralph Cragin

To Active Duty

Ralph Cragin, secretary of Consolidated Steel Corporation, Ltd., with headquarters in Los Angeles, was called to active duty for one year from December 20 as lieutenant-colonel in the Ordnance Reserve, U. S. Army. Lieut.-Colonel Cragin's first station is the Los Angeles Ordnance Region, with offices in the Chamber of Commerce Building. He is on a year's leave from the Consolidated Steel organization.

Two Million Addition

R. J. Lamont, president of the Seattle-Tacoma Shipbuilding Co., disclosed on January 2 a contemplated two million dollar addition to the big $5,000,000 plant now under construction at Harbor Island, Seattle, contingent upon the award to the company of a contract for the construction of two $35,000,000 passenger boats convertible into airplane carriers.

Lamont admitted negotiations had been going on intermittently with the government ever since his concern submitted its bid on the vessels two months ago. Congressman Magnuson from Washington, D. C., has sent word to Seattle that it is his opinion that the award will be made to the Puget Sound company in the near future.

While no award has been made by the Maritime Commission as yet, Lamont states as this is being written that it looks as though the contract is getting a little closer. The company's bid was around $25,000,000 for each ship.

To handle the additional work it will be necessary to build two additional ways, another outfitting pier and various shops and construction would need to proceed at once. The ships are to be 759 ft. long, with a speed of 24 knots.

Propeller Club News of the Month

The Port of San Francisco

Charles L. Wheeler
President
John E. Cushing
First Vice-President
Arthur B. Poole
Second Vice-President
Hugh Gallagher
Third Vice-President
Eugene F. Hoffman
Secretary-Treasurer

BOARD OF GOVERNORS

- **Frazer A. Bailey**
- **Capt. Henry Blackstone**
- **John E. Cushing**
- **Fred L. Doelker**
- **Hugh Gallagher**
- **A. S. Gunn**
- **Edward S. Harms**
- **George Jordan**
- **Roger D. Lapham**
- **Marshall Levis**
- **Ira S. Lillick**
- **Capt. Lewis Mesherry**
- **Joseph A. Moore**
- **Arthur B. Poole**
- **Charles L. Wheeler**

It's San Francisco in 1941!

Back from the National Convention in New Orleans return our official delegates—empowered by the Directors of the Port of San Francisco to invite the Propeller Clubs of the United States to convene in the City by the Golden Gate in 1941!

Missionaries were headed by Edward H. Harms and his capable aides included Robert Fouke, Robert Spear, Arthur Poole and Roger Lapham. Congratulations are in order and we can rest assured that "San Francisco" will plan a convention which will measure up to all previous standards.

President Charles L. Wheeler is already making preliminary plans for the complete success of the national get-together—the first to be scheduled for the Pacific Coast. A special program announced for Wednesday, January 8th, will start the ball a-rolling!

This program promises to take on a vibrant note of victory with the New Orleans convention covered in retrospect—and with the keynoting of the coming event by President Wheeler on the theme: "Forward for '41!"

The announcement reads:

New Orleans Propeller
Club Convention to Be
Re-enacted at Palace Hotel

Don't Miss the Big Luncheon Meeting

WEDNESDAY, JANUARY 8th

Comstock Room, Palace Hotel, 12:15 Noon

- Hear all the gory details of how San Francisco's "Wrecking Crew" (composed of Laphams, father & son, Arthur Poole, Eddie Harms, and the "Robert" twins, Fouke and Spear) battered down all opposition to bring the 1941 National Convention to San Francisco!
- Drink Sazerac cocktails, "imported" direct from Antoines by Harms and Spear!
- Hear 5-minute talks by:
  Bob Fouke on Resolutions;
  Bob Spear on Convention Speeches;
  Eddie Harms on Entertainment and election;
  Arthur Poole on Admiral Land's talk & Convention Sidelights;
  Roger Lapham, General Comment and Convention Résumé;
  President Charles Wheeler on "Forward for '41."
- Authentic Convention Atmosphere, Menu and Favors!
- Mark your Calendar NOW!!!
  EUGENE HOFFMAN, *Secretary.*

The Port of Los Angeles

Propeller Club No. 66, Port of Los Angeles, honored **Glen A. Arbogast,** retiring president of the Los Angeles Board of Harbor Commissioners and past president of the Pacific Coast Association of Port Authorities, at its December luncheon held Wednesday, the 18th, in the dining room of the Chamber of Commerce.

Mr. Arbogast, president of Newberry Electric Corporation, served on the Harbor Board for a period of seven years. Projects directly related to the National Defense Program necessitated his giving up his civic duties. The Board of Governors passed a resolution in recognition of Mr. Arbogast's services to the steamship industry. The resolution was read to the luncheon group by Fred A. Hooper, district manager for American Hawaiian Steamship Company and chairman of the resolutions committee.

Ralph J. Chandler, resident manager for Matson Navigation Company and president of the Los Angeles Propeller Club, reported on the New Orleans convention of the Propeller Club of the United States. He urged local members to prepare their next year's program so that they will be in attendance at the annual convention which was voted to San Francisco for 1941.

James Adams, chairman of the House Committee, announced that the meeting next month will be held on January 22 aboard the California Maritime Academy's ship California State, which will be in port at that time.

Edw. H. Harms
He and his aids brought back '41 Convention

Pillsbury-Martignoni Partnership

P M R is pleased indeed to reproduce the following announcement:

We take pleasure in announcing the formation of the partnership of Pillsbury & Martignoni to carry on business as consulting engineers, marine surveyors, ship brokers and appraisers at San Francisco.

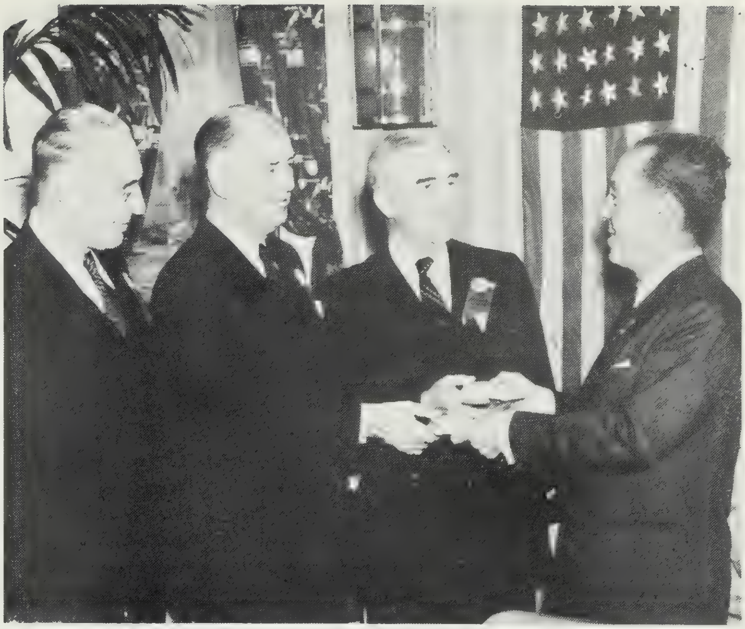
The corporation known as Pillsbury & Curtis will be dissolved. The Wilmington Office of Pillsbury & Curtis will be discontinued. Messrs. Frank S. Dupuy and W. H. Curtis will carry on as individuals at 305½ North Avalon Boulevard, Wilmington, California.

W. L. MARTIGNONI

A. F. PILLSBURY

100 Bush Street

San Francisco, Calif. January 2, 1941.



Left: P. D. Briggs, general sales manager, looks on approvingly as Mr. Frank (right) presents Mr. Tompkins (left, center) and Mr. Lennon (right, center) with gold watches commemorating their 25 years service with the Ilg Electric Ventilating Company

Capt. A. F. Pillsbury

Announcement

On November 15th the Tampa Shipbuilding Company, Incorporated, organized under the laws of the State of Florida, took over the business formerly conducted by the Tampa Shipbuilding & Engineering Company. The company has assumed all liabilities, assets, contracts, plant and goodwill of the organization under the former name.

Ilg Men Are Honored

As a highlight of the 1941 Sales Convention of the Ilg Electric Ventilating Co., now under way at Hotel Astor, two men were initiated into the Ilg 25-Year Club on December 13th.

J. O. Lennon, present New York manager, who started with the company in 1914, received one of the honor awards.

The other award was given to **M. C. Tompkins,** Boston Manager, who also joined the company in 1914.

The presentation of gold watches as tokens of membership in the club was made by J. M. Frank, President of the company, at a dinner in the College Hall. Frank, together with other members of the executive staff from the home office of the company in Chicago, is here to unveil plans for the 1941 promotional program on kitchen ventilating fans, night cooling fans, propeller fans, blowers, unit heaters and unit coolers made by Ilg.

Bilge Club Holds Annual Fete

At the California Yacht Club in Wilmington the Bilge Club, on the evening of Friday, December 13, 1940, held its Annual Informal Winter Dinner.

This is an annual affair for members only.

Chairman Lloyd J. Moore's instructions to all good Bilgers were:

Be on board the M.S. BILGE, Friday, December 13th. Location, Berth No. 193, California Yacht Club. Gang Turns to—For Liquid Cargo (Slow Ahead) 6:30 P.M.

For Stewards Stores (Full Ahead), 7:30 P.M. (No overtime).

All members of the crew were informed that should they fail to report as directed above, they would be promptly Keel-Hauled.

Over 120 of the "Crew" obeyed the summons. They were served with one of the Yacht Club's justly famous fish dinners after which they enjoyed a most excellent program which was presented under the Committee of Chairman John Eidom. An impromptu interlude was a duet by Ray Mitchell and Ed Kellenberger, which was received with uproarious applause.

After the entertainment, the members foregathered at the bar for a few sea chanteys and in the Club room for other diversion.

Crane Expands Coast Personnel

Augmenting the extensive service which the Crane Co. of Chicago have been rendering through its coast branches, the company has sent to Seattle **A. M. McDougall,** to specialize in marine contacts, co-ordinate deliveries, assist with engineering problems and do other important liaison work with the navy, army, merchant marine and private shipbuilders.

Coming from the New York branch where he has been doing similar work, Mr. McDougall will make headquarters in Seattle but also probably include the entire coast in his work, as he has behind him a background of experience in the marine field which could qualify him to render valuable service to the many shipbuilding companies who use Crane valves, fittings, plumbing and many other marine accessories.

Mr. McDougall comes from a marine and shipbuilding family and has spent his entire life in that environment. He started work with the Crane Co. at the New York office in 1935, first spending a year on factory experimental work, assembly, testing, etc., primarily on equipment relating to navy, merchant marine and private shipbuilding. He later worked in the marine sales department at the general office, beginning in 1936, handling quotations on navy and other ship materials. In 1938 he was transferred to the Long Island City branch where he worked with the Brooklyn navy yard, private builders, naval architects and ship operating companies, doing general field engineering. His transfer to Seattle was as of November 1st, where he now has special charge of marine and shipbuilding accounts, one of his duties being to anticipate the needs of the various yards, insure prompt delivery from stock on hand or to order production ahead of time where necessary.

Crane Co. started in 1935 on mass production methods for the marine industry, not only turning out products in quantities, but stocking them under lock and key for immediate availability when needed. Six naval inspectors work at the plant all day long inspecting the essential products as they come off the line, approving them and marking them so that they can be warehoused and classified for needed delivery.

"As Ford makes automobiles, so Crane Co. are now turning out their various products, especially during the last two years," said Mr. McDougall to our Seattle representative. "My job is to let the navy, merchant marine and the shipbuilders know about this service, and then train them to anticipate their wants so that there will be no delay in delivery."

Moore-McCormack Launchings

Within a three-day period this week, Moore-McCormack Lines launched two new ships for its American Republics Line service to the east coast of South America, according to **Albert V. Moore,** president of the company. The vessels were the Rio Parana, a passenger vessel, launched Wednesday, December 18, at the Sun Shipbuilding & Dry Dock Co., Chester, Pa., and the cargo liner Mormacpenn, launched December 18 at the Ingalls Shipbuilding Co. at Pascagoula, Mississippi.

Before going down the ways, the Rio Parana was blessed by His Eminence Dennis Cardinal Dougherty of Philadelphia, who last year visited the east coast of South America and was enthusiastically received in Brazil, Uruguay and Argentina.

Miss Kay Calder Lee of Brooklyn, N. Y., daughter of Commander and Mrs. Robert C. Lee, sponsored the Rio Parana. Commander Lee is executive vice president of Moore-McCormack Lines.

The Rio Parana is the second of four new passenger liners being built by Moore-McCormack Lines for operation to the east coast of South America. She and her sister ships will carry 197 passengers each and will be the first ever built with air conditioning in all staterooms as well as public rooms. These passenger ships will cost $20,000,000 and will enter service in 1941.

The Mormacpenn, second ship to be launched by Moore-McCormack Lines in the three-day period, was sponsored by Mrs. Carl F. Farbach, wife of the general counsel of the United States Maritime Commission. This "Mormac Clipper" has a deadweight capacity of 12,800 tons and a gross register tonnage of 7773 tons. She will have a cargo capacity of 720,000 bale cubic feet, including 40,000 cubic feet refrigerated, and will have accommodations for twelve passengers.

Capt. Arthur Sowden

Capt. Sowden Is Mourned

The shipping fraternity has been saddened by the recent passing of **Captain Arthur B. Sowden,** veteran shipmaster of the Atlantic and Pacific Coasts, who died at the Marine Hospital in Norfolk, Virginia, at the age of sixty-eight. He was a lieutenant commander in the Navy during the World War, having command of one of the largest troop ships crossing the Atlantic, and he sailed every sea except the Antarctic.

For many years he was on the San Francisco-China run for Standard Oil Company of California, sailing on the tankers Acme, Astral and others. He was also master of the Sabine Transportation Company tanker Raleigh Warner, whose usual run was between Carteret, N. J., and Port Arthur, Texas.

Captain Sowden had vast experience in seafaring, and was noted for the safety with which he insisted every voyage be made on his ship. He held frequent fire drills, and had all equipment constantly used and checked up to prevent disaster. He had no specific hours, but was always on the bridge when there was any possibility of his being needed.

He leaves a widow, Mary B. Sowden, of San Francisco.

To New Post With National Supply

The National Supply Company recently announced the appointment of Fred R. Lowell as its Manager of Engine Sales.

Mr. Lowell has been affiliated with The National Supply organization since April, 1936, when he assumed charge of the company's Commercial Engine Sales in the Southwest with headquarters at Houston, Texas. In January, 1940, he was transferred to Springfield, Ohio, to become Manager of Oil Field Engine Sales and occupied this position at the time of his present appointment.

Following his graduation from the University of Wisconsin in Engineering in 1926, Mr. Lowell associated with the Engineering Department of Fairbanks-Morse & Company. In 1928 he joined the Engine Sales Stall at the Chicago office and in June, 1933, became Fairbanks representative to the Philippine Islands in charge of Sales and Service of all the company's products.

In June, 1933, he was made Manager of Export Division Machinery Department of Fairbanks-Morse with headquarters in New York. Mr. Lowell resigned this position in April, 1936, to join the National's Sales Staff.

Big Liners Coming

Heralding the resumption of intercoastal service, W. H. Maybaum, U. S. Lines passenger traffic manager, has recently announced that requests for passenger space on the S.S. America, S.S. Manhattan and S.S. Washington were "pouring in" from all parts of the country.

With the first sailing from New York scheduled for the S.S. Manhattan, January 10, the American Merchant Marine flagships will offer a 14-day "All American" cruise voyage between New York and California via Havana, Balboa, Cristobal and Acapulco.

"The new S.S. America and the established favorites of the transatlantic traveler, the S.S. Washington and S.S. Manhattan, will offer de luxe winter cruises to colorful ports and sunshine voyages to New York," said Maybaum. "The three United States Lines luxury liners are the finest, fastest and largest passenger liners flying the American flag."

Shell Marine Appointment

A. N. Biddle

A. N. Biddle is the recently appointed Marine Sales Representative for Shell Oil in San Francisco.

He served his apprenticeship with the Moore Scott Ship Yards in San Francisco and for 7 years was in the United States Navy as machinist mate.

Biddle sailed on the East Coast as an engineer for the U. S. Shipping Board; in the Gulf with the Shipping Board; and on New York to San Francisco run with the Panama Mail Line.

He was chief engineer of the Shell Building in San Francisco for a number of years, and is now replacing Joe Hare as Marine Sales Representative for the Shell Oil Company, Incorporated.

A. H. Ferbert

McCormick Charter

Due to large defense orders and generally bettering business conditions the McCormick Steamship Company has found it necessary to charter the S.S. Diamond Cement in order to take care of unusually heavy demands for southbound lumber and northbound space for general cargo between Puget Sound Ports and Los Angeles and San Francisco Bay Area.

The S.S. Diamond Cement is 357 feet overall, with a beam of 50 feet and her gross tonnage is 3993. This vessel was built in 1919.

Formerly operated in the Alaskan Trade, the S.S. Diamond Cement is the largest vessel operating strictly in the Pacific Coastwise Trade and it will augment the service of the McCormick Steamship Company, which offers frequent sailings between Puget Sound and California Ports.

The appointment of A. L. Quackenboss as Assistant Manager Marine Operations for the Union Oil Company was recently announced by W. L. Stewart, Jr., Vice President. Quackenboss assumes the new position, possessing an able background of experience with the Company's Marine Department. For seven years he acted as the Company's Marine Representative at Oleum and prior to his new appointment he served as Ship Dispatcher for the Company.

New President For Pittsburgh S.S. Co.

On December 5, 1940, A. H. Ferbert was elected president of Pittsburgh Steamship Company, United States Steel Corporation subsidiary, succeeding A. F. Harvey, who is retiring after thirty-nine years of service with the organization.

Born in Cleveland, where Pittsburgh Steamship Company has its principal office, Mr. Ferbert became associated with the company in 1904 ,starting as a stenographer. He was in the order department from 1906 to 1912, at which time he was appointed dispatcher. In 1922 he was made traffic manager, and in 1924 vice president, which position he has held until the present time.

Mr. Ferbert is a director of Pittsburgh Steamship Company and Pittsburgh Supply Company. He is a member of the Westwood Country Club, Union Club of Cleveland, Mid-Day Club, Rotary Club and Cleveland Chamber of Commerce.

Valvoline Oil Company boat Tip Top, said to be first internal combustion engined craft in New York Harbor

Diamond Jubilee for Valvoline

Nineteen forty-one marks the completion of seventy-five years of uninterrupted existence for the Valvoline Oil Company, makers of the first of the Pennsylvania lubricants, it is announced by G. P. Doll, president of the company.

But the organization wants it understood, he declared, that while it has reached a ripe old age, it is just as young in spirit and just as aggressive as in its early pioneer days. Proud of its past, Valvoline looks to the future for even greater achievements, and an important new merchandising program will soon be announced.

Early Struggles

The parent organization was launched in 1866, Mr. Doll explained, by Dr. John Ellis, a Michigan homeopathic physician, who became interested in Pennsylvania pertoleum products during the Civil War.

Dr. Ellis organized The Continuous Oil Refining Company (which later changed its name to Leonard & Ellis and then to Valvoline Oil Company) to distill and market what was then known as "rock oil." He already had patents which made possible for the first time the commercial refining of steam cylinder lubricants and other oils of good quality. The company started in a very modest way with a ten-barrel super-heated steam still.

At that time steam cylinder lubrication was accomplished by means of tallow, suet, lard or compounds of vegetable or animal origin. Severe corrosion and gumming resulted, yet prejudice against them was so strong that Dr. Ellis faced enormous opposition with his petroleum cylinder oil. Not until the noted engine builder, George Corliss, adopted the new lubricant, did its use spread.

Among the first to approve was the Singer Sewing Machine organization, a Valvoline customer today and throughout more than 71 years. The Erie Railroad, Lehigh Valley and others adopted Valvoline, and the original company expanded rapidly.

Some "Famous Firsts"

In 1868 the first mineral lubricating oil refinery ever built was erected in Brooklyn. Crude oil was brought from Pennsylvania in wooden tank cars. Despite the cumbersome methods of those days, the oils turned out by the original refinery were real lubricants. Valvoline Cylinder Oil won the gold medal at Paris in 1875 and at the Philadelphia Centennial in 1876.

The world's first turbine oil was made by Dr. Ellis in 1884 for Sir Charles Parsons of Newcastle-on-Tyne, England, the world's first turbine builder, whose company is still a customer.

As early as 1888 this oil was being used for gasoline engine oils, and when the first American automobile was built in 1893 by Elwood Haynes of Indiana, it was the lubricant.

Insistence on Quality

Throughout its long, successful history, the Valvoline policy has been one of rigid adherence to original standards of highest quality. President Doll reaffirms today:

"This policy has been carried on, and will continue to be the guiding spirit of Valvoline. That is our pledge as we prepare to celebrate the first Diamond Jubilee in Mineral Oil Lubricating History."

Fred R. Davis

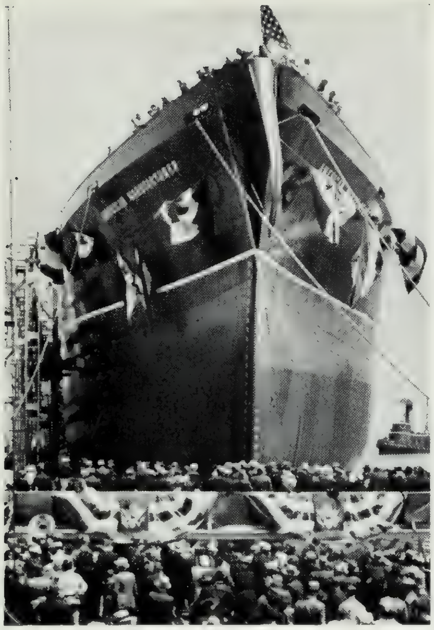
Fred R. Davis, a founder of the Audit Bureau of Circulation and advertising space buyer for the General Electric Company at Schenectady for 35 years, died December 26 at his home in Schenectady after an illness of two years. He was 64 years old. For many years he supervised the expenditure of more than a million dollars annually for newspaper and magazine space.

A man of scientific training himself, Mr. Davis was a pioneer advocate of accurate measurement in advertising and helped found the Audit Bureau of Circulations in 1914. He served as a director from that date until his death and since 1927 had also been first vice president of the organization.

Mr. Davis was born in Adams, Mass., attended Union College in Schenectady, and was graduated from Worcester Polytechnic Institute in 1900 with the degrees of B.S. and M.S. in engineering. In 1901, he entered the G-E organization as a test student and in 1902 went to Fort Wayne, Indiana, as publicity manager of the Fort Wayne Electric Company. In 1905 he joined the G-E advertising department in Schenectady.

He was an elder of the First Presbyterian Church of Schenectady, a member of the Technical Publicity Association, and a member of the Phi Gamma Delta fraternity.

PROGRESS IN American Shipyards



Pacific Coast

ASSOCIATED SHIPBUILDERS
Seattle, Wash.

New Construction:

Four seaplane tenders for U. S. Navy.

One 500-ton open lighter for delivery to U. S. Navy at Puget Sound Navy Yard.

One 500-ton covered lighter for delivery to U. S. Navy at Puget Sound Navy Yard.

One insulated self-propelled lighter for delivery to U. S. Navy at Puget Sound Navy Yard.

Conversion:

City of Newport News to transport.

ASTORIA MARINE CONSTRUCTION CO.
Astoria, Ore.

New Construction:

Hull No. 1100, wood hull troller. 41′ x 11′ x 4′6″; Chrysler Crown engine.

Hull No. 1090, wood hull trawler for stock. 56′ x 15′6″ x 7′6″; 135-hp Superior diesel engine.

BASALT ROCK CO., INC.
Napa, Calif.

New Construction:

Eight steel open lighters; owner, Bureau of Supplies and Accounts, Navy Dept., Washington, D. C. Delivery at Mare Island. 110′ x 34′ x 11′3″. Contract awarded September 5, 1940.

Eight steel seagoing 1000-ton cargo barges; contractors, Pacific Navy Air Bases. Delivery at San Francisco Bay. 150′ x 40′ x 12′. Contract awarded November 15, 1940.

BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Division
(Union Plant)
San Francisco, Calif.

New Construction:

Hulls Nos. 5360-5364, five C-1 cargo vessels for U. S. Maritime Commission. 395′ x 60′ x 37′6″; 6400 gross tons each; 4000 hp. Full scantling steam propulsion type. Keels laid, No. 5362, August 8, 1940; No. 5363, October 9, 1940. Launching dates, No. 5360, August 6, 1940; No. 5361, October 4, 1940.

Twenty-five 2100-ton destroyers for U. S. Navy.

Two 1650-ton destroyers for U. S. Navy.

Four 6000-ton cruisers for U. S. Navy.

BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Division
San Pedro, Calif.

New Construction:

Ten 2100-ton destroyers for U. S. Navy.

COMMERCIAL IRON WORKS
Portland, Ore.

New Construction:

Four anti-submarine net tenders.

CONSOLIDATED STEEL CORP., LTD.
Los Angeles, Calif.

New Construction:

Hulls Nos. 156-159, four C-1-BT, full scantling, turbine propulsion cargo vessels for U. S. Maritime Commission. Launching dates, No. 156, November 14, 1940; February 19, April 28 and July 24, 1941; delivery dates March 3, June 2, September 4 and November 4, 1941.

Thirty-two steel lighters.

Two transports for U. S. Navy.

GENERAL ENGINEERING & DRY DOCK CO.
Alameda, Calif.

New Construction:

Four anti-submarine net tenders for U. S. Navy.

Four mine sweepers for U. S. Navy.

HARBOR BOAT BUILDING CO.
Terminal Island, Calif.

New Construction:

Hull No. 65, tuna bait boat for Van Camp Sea Food and Balestreri partners. Length 100′, breadth 25′, depth 11′; 150 gross tons; Fairbanks-Morse diesel, 300 hp; 10 knots speed; cost $160,000. Launched October 6, 1940; **delivery date December 1, 1940.**

LAKE WASHINGTON SHIPYARDS
Houghton, Wash.

New Construction:

Four anti-submarine net tenders.

Four thousand A. S. N. T. floats.

Coast and Geodetic Survey ship.

Six seaplane tenders for U. S. Navy.

LOS ANGELES SHIPBUILDING & DRY DOCK CO.
Los Angeles, Calif.

New Construction:

Three fleet repair vessels for U. S. Navy.

MARE ISLAND NAVY YARD
Mare Island, Calif.

New Construction:

SS203, Tuna, submarine. Launched October 2, 1940.

SS211, Gudgeon, submarine. Keel laid November 22, 1939.

AS11, Fulton, submarine tender. Keel laid July 19, 1939.

YO44 and YO45, two fuel barges. Keel laying date, No. YO45, October 9, 1940; launching date, No. YO44, September 17, 1940.

YSD14, seaplane wrecking derrick. Completion date December 15, 1940.

AS12, Sperry, submarine tender. Order placed June 12, 1940.

SS236, Silversides, submarine. Keel laying date November 4, 1940.

Trigger (SS237), Wahoo (SS238) and Whale (SS239); three submarines. Order placed June 28, 1940.

SS281 and SS282, two submarines. Order placed September 9, 1940.

AS15 and AS16, two submarine tenders. Order placed October 3, 1940.

MOORE DRY DOCK CO.
Oakland, Calif.

New Construction:

Hull No. 196, Mormacstar, cargo vessel for U. S. Maritime Commission and Moore-McCormack Company. LOA 492′0″, LBP 465′, breadth molded 69′6″, depth molded 42′6″; shp normal 8500, shp max. 9350; dis. 17,600 tons; deadweight 11,926 tons; steam turbine propelled. **Estimated delivery date January 23, 1941.**

Hulls Nos. 197, Mormacsea; and 198, Mormacsun; two C-3 vessels for U. S. Maritime Commission. LOA 492′0″, LBP 465′, breadth molded 69′6″, depth molded 42′6″. Estimated delivery dates March 1 and March 24, 1941.

Hulls Nos. 199-200, two caisson gates for Bureau of Yards and Docks; one for D. D. No. 2, Pearl Harbor, T. H.; one for D. D. No. 5, Puget Sound, Wash. 150′ x 22′ x 57′; 1800 tons weight. Delivery date May, 1941.

Hulls Nos. 201-203, three cargo and passenger vessels for U. S. Maritime Commission and Alcoa Steamship Co. 442′ x 62′ x 25′; depth molded to bridge deck 41′6″; 8500 hp; 17 knots speed; passenger carrying capacity 38. Estimated keel laying dates February 3, June 16 and September 10, 1941. Estimated delivery dates January 1, March 15 and June 1, 1942.

Hulls Nos. 204-206, three defense vessels for U. S. Navy and Dravo Corp. 110′ x 34′ x 11′3″ molded depth; two diesel-driven generators.

Two submarine tenders for U. S. Navy.

Five submarine rescue vessels for U. S. Navy.

Conversion:

Hull No. 195, U. S. S. Tangier, to seaplane tender for U. S. Navy.

OSLON & SUNDE MARINE WORKS
Seattle, Wash.

Conversion:

Three 90-foot fishing boats for U. S. Navy. **Completed in December, 1940.**

PACIFIC BRIDGE CO.
San Francisco, Calif.

New Construction:

One seagoing drydock for U. S. Navy. Cost $1,649,000.

PACIFIC DRY DOCK & REPAIR CO.
Oakland, Calif.

New Construction:

One all-welded steel oil barge. 148′ x 38′ x 9′; 500,000 gal. capacity.

Lighters. Cost $284,572.

THE PUGET SOUND NAVY YARD
Bremerton, Wash.

New Construction:

DD436, Monssen, destroyer. Launched May 16, 1940.

YT139, Ala. Launched November 6, 1939.

AVP10, Barnegat, seaplane tender. Keel laid October 27, 1939.

AVP11, Biscayne, seaplane tender. Keel laid October 27, 1939.

AVP10, Casco, seaplane tender. Keel laid May 30, 1940.

AVP13, Mackinac, seaplane tender. Keel laid May 30, 1940.

YSD15, seaplane wrecking derrick. Keel laid September 10, 1940.

Ships authorized: DD480, Halford; DD481, Leutze; DD592-DD597, eight destroyers; YSD18, YSD24, YSD26, four seaplane wrecking derricks; one destroyer.

SEATTLE-TACOMA SHIPBUILDING CORP.
Seattle, Wash.

TACOMA PLANT

New Construction:

Hulls Nos. 1-2; 3, Cape Cleare; 4-5; five C-1 cargo vessels for U. S. Maritime Commission. Single screw, full scantling diesel propulsion type. Two General M.A.N. 2100-hp engines; 14 knots speed. **Launching dates, No. 4, January 25, 1941;** No. 5, March 6, 1941. **Delivery dates, No. 1, January 7,** No. 2, March 8, No. 3, May 7, No. 4, July 6, No. 5, **September 4, 1941.**

Hulls Nos. 6-9, four C-3 cargo ships for U. S. Maritime Commission. 465′ x 69′6″ x 33′; 8900 tons; 8500-hp steam turbine propulsion; cost $2,990,000. Keel laying dates, February 20, April 15, July 8 and August 22, 1941. Launching dates, July 1, August 15, November 1 and December 20, 1941. Delivery dates, November 1, 1941, December 4, 1941, January 1 and March 1, 1942.

Hulls Nos. 10-11, two C-3 shelter deck type cargo steamers for U. S. Maritime Commission. To be converted on completion to U. S. Navy troop ships. Keel laying dates, November 8 and December 28, 1941. Launching dates, February 8 and April 6, 1942. Delivery dates, April 5 and May 28, 1942.

SEATTLE PLANT

New Construction:

Twenty-five destroyers for U. S. Navy.

TODD-CALIFORNIA SHIPBUILDING CORP.
Richmond, Calif.

New Construction:

Thirty cargo vessels for British Purchasing Commission. Cost $50,000,000.

TODD-SEATTLE DRY DOCKS
Seattle, Wash.

Conversion work.

WESTERN BOAT BUILDING CO., INC.
Tacoma, Wash.

New Construction:

Hull No. 144, purse seine fishing boat. 95′ x 24′; for stock. Keel laid September 10, 1940.

Hull No. 145, fishing boat. 115′ x 26′. Keel laid October 1, 1940.

Conversion:

Fishing boat Majestic conversion to naval use.

WESTERN PIPE AND STEEL CO.
South San Francisco, Calif.

New Construction:

Hulls Nos. 57-61, five C-1 cargo vessels for U. S. Maritime Commission. Full scantling diesel propulsion type; single screw; two Busch-Sulzer 2100-hp engines. Keel laying date, No. 61, December 23, 1940 (est.). **Launching dates,** August 8, October 8, **December 17, 1940 (est.);** February 15 and April 22, 1941 (est.). **Delivery dates, January 16,** March 17, May 16, July 15 and September 13, **1941.**

Hulls Nos. 62-65, four C-3 cargo ships for U. S. Maritime Commission. 492′ x 69′ x 42′6″; 8900 tons; 8500-hp; steam propulsion; $2,990,000 each.

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AMERICAN BRIDGE COMPANY
Pittsburgh, Pa.

New Construction:

Fifteen freight barges for Inland Waterways Corp., St. Louis, Mo. 280′ x 48′ x 11′.

THE AMERICAN SHIP BUILDING CO.
Cleveland, Ohio

New Construction:

Twelve net tenders for U. S. Navy (6 at Lorain, Ohio; 6 at Cleveland, Ohio). 151′8″ x 30′6″ x 16′6″; diesel-electric propulsion; contract price $6,357,000. Keels laid October 18, 1940.

BATH IRON WORKS
Bath, Maine

New Construction:

Hull No. 181, DD430, Eberle; 1620-ton destroyer for U. S. Navy. **Delivery date December, 1940.**

Hulls Nos. 182-183, DD437, Woolsey; and DD438, Ludlow; two 1620-ton destroyers for U. S. Navy. Delivery dates May and July, 1941.

Hulls Nos. 184-187, four cargo ships for American Export Line. 400′ x 60′ x 39′. Delivery dates September and October, 1941, and April and June, 1942.

Hulls Nos. 188-189, DD457 and DD458, two destroyers for U. S. Navy. Delivery dates December, 1941, and February, 1942.

Hulls Nos. 190-195, DD449-451, 467-469, six destroyers for U. S. Navy.

Hulls Nos. 196-206, DD507-DD517, eleven destroyers for U. S. Navy.

Hulls Nos. 208-213, DD631, DD642-DD646, six destroyers for U. S. Navy.

BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Division
Fore River Yard
Quincy, Mass.

New Construction:

Hull No. 1478, Massachusetts, 35,000-ton battleship for U. S. Navy. Keel laid July 20, 1939.

Hulls Nos. 1479, San Diego; and 1480, San Juan; two 6000-ton cruisers for U. S. Navy. Keels laid March 27 and May 15, 1940.

Hull No. 1484, cargo vessel for U. S. Maritime Commission. 450′ x 66′ x 42′3″; 16½ knots; geared turbines and water tube boilers; 14,500 tons. Launching date November 16, 1940.

Hulls Nos. 1485-1487, three tankers. 502′ x 68′ x 37′; 21,000 tons. Keels laid July 1, August 7 and September 26, 1940.

Hulls Nos. 1488-1491, four tankers for Sinclair Refining Co. 10,700 tons dwt. Keel laid, No. 1488, November 21, 1940.

Hulls Nos. 1492-1493, two tankers for Sinclair Refining Co. 15,450 tons dwt.

Hulls Nos. 1494-1497, four heavy cruisers for U. S. Navy.

Hulls Nos. 1498-1501, four light cruisers for U. S. Navy.

Hulls Nos. 1502-1503, two light cruisers for U. S. Navy.

Hulls Nos. 1504-1507, four heavy cruisers for U. S. Navy.

Hulls Nos. 1508-1511, four aircraft carriers for U. S. Navy.

Hulls Nos. 1512-1515, four trawlers.

Hulls Nos. 1516-1519, four 1650-ton destroyers for U. S. Navy.

BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Division
Sparrows Point Yard
Sparrows Point, Md.

New Construction:

Hulls Nos. 4341, Robin Locksley; 4342, Robin Doncaster; 4343; three cargo vessels for Seas Shipping Co. LOA 485′, LBP 450′, beam 66′, draft 43′. **Launching dates,** No. 4341, October 5, 1940; **No. 4342, December 7, 1940.**

Hulls Nos. 4345, Lipscomb Lykes; 4346, Thompson Lykes; 4347-4348; four C-1 cargo vessels. LOA 417′, LBP 395′, beam 60′, depth 37′6″. **Launching dates,** No. 4345, September 7, 1940; **No. 4346, December 21, 1940.**

Hulls Nos. 4350-4352, three cargo vessels for Seas Shipping Co. 450′ x 66′ x 34′; 6300 hp; 8500 gross tons.

Hulls Nos. 4353-4356, four oil tankers for Socony Vacuum Oil Co. 487′6″ x 68′ x 37′; 12,000 hp; 9,800 gross tons.

Hull No. 4357 oil tanker for Union Oil Co. of Calif. 442′ x 63′ x 34′10″; 3500 hp; 8000 gross tons.

Hulls Nos. 4358-4359, two oil tankers for Socony Vacuum Oil Co. 487′6″ x 68′ x 37′; 12,000 hp; 9800 gross tons.

Hulls Nos. 4360-4361, two oil tankers for Union Oil Co. 442′ x 64′ x 34′10″; 3500 hp; 8000 gross tons.

Hulls Nos. 4362-4364, three cargo and passenger vessels for Mississippi Shipping Co. 465′ x 65′6″ x 39′9″; 8600 hp; 8300 gross tons.

Hull No. 4365, oil tanker for Richfield Oil Co. 442′ x 64′ x 34′10″; 3500 hp; 8000 gross tons.

Hulls Nos. 4367-4368, two oil tankers for Panama Transport Co. 487′6″ x 68′ x 37′; 7000 hp; 9800 gross tons.

Hull No. 4369, oil tanker for Continental Oil Co. 442′ x 64′ x 34′10″; 3500 hp; 8000 gross tons.

BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Division
Staten Island Yard
Staten Island, N. Y.

New Construction:

Hulls Nos. 8015-8019, five C-1-B design cargo vessels for U. S. Maritime Commission. 417′9″ x 60′ x 37′5″. **Launching dates,** No. 8016, November 2, 1940; **No. 8017, December 28, 1940;** No. 8018, March 15, 1941; No. 8019, April 15, 1941. Delivery dates April 1, June 1, August 1 and November 1, 1941, and January 1, 1942.

Hulls Nos. 8021-8022, two destroyers for U. S. Navy.

Hulls Nos. 8023-8032, ten destroyers for U. S. Navy.

BOSTON NAVY YARD
Boston, Mass.

New Construction:

DD433, Gwin, 1600-ton destroyer. Completion date March 1, 1941.

DD434, Meredith, 1600-ton destroyer. Completion date May 1, 1941.

DD441, Wilkes, 1600-ton destroyer. Completion date July 1, 1941.

DD442, Nicholson, 1600-ton destroyer. Completion date September 1, 1941.

DD461, 1600-ton destroyer. Completion date February 12, 1942.

DD462, 1600-ton destroyer. Completion date April 12, 1942.

DD472, 1600-ton destroyer. Completion date March 1, 1943.

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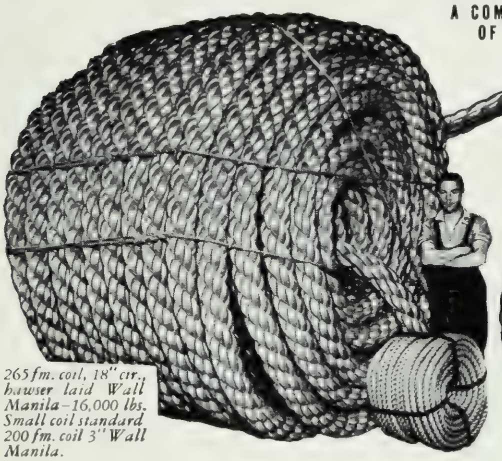

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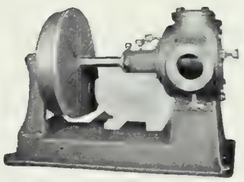

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DD473, 1600-ton destroyer. Completion date May 1, 1943.

DD474, 1600-ton destroyer. Completion date July 1, 1943.

DD475, 1600-ton destroyer. Completion date September 1, 1943.

DD476, 1600-ton destroyer. Completion date January 1, 1943.

AVP21, Humboldt, seaplane tender. Completion date October 12, 1941.

AVP22, Matagorda, seaplane tender. Completion date December 12, 1941.

YSD20, seaplane wrecking derrick. Completion date May 1, 1941.

YSD22, seaplane wrecking derrick. Completion date January 1, 1941.

YSD23, seaplane wrecking derrick. Completion date March 1, 1941.

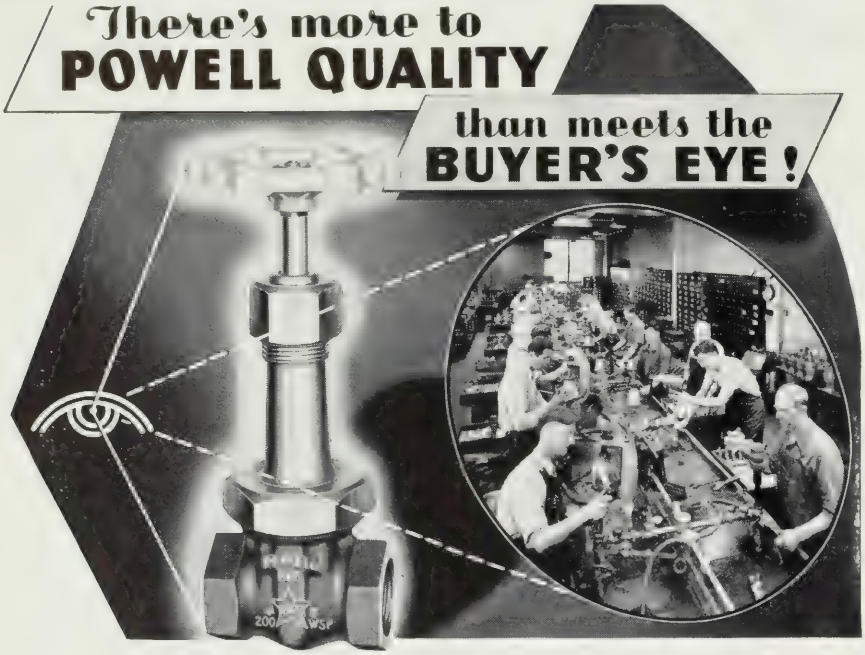
BROOKLYN NAVY YARD
Brooklyn, N. Y.

New Construction:

BB 55, North Carolina, battleship. LBP 714'0", beam to outside armor 108'0"; std. displ. 35,000 tons; geared turbine engines; express type boilers. Contract delivery date September 1, 1941; estimated delivery date, October 15, 1941.

BB 61, Iowa, battleship. LOA 880", beam 108'; 4500 tons standard displacement; geared turbines. Contract delivery date August 1, 1943.

BB 63, Missouri, battleship. LOA 880', beam 108'; 4500 tons standard displacement; geared turbines. Order placed June 12, 1940.



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IRA S. BUSHEY & SONS, INC.
Brooklyn, N. Y.

New Construction:

Hull No. 486, tug. 100'; 805-hp F-M diesel.

Hull No. 490, tug. 90'; 805-hp F-M diesel.

Hull No. 491, wooden drydock section for Bethlehem Steel Co. Delivery date 150 days.

Hull No. 493, tug. 100'; 805-hp F-M diesel.

Hull No. 494, tug. 90'; 805-hp F-M diesel.

CRAMP SHIPBUILDING COMPANY
Philadelphia, Pa.

New Construction:

Six cruisers, Cleveland class, for U. S. Navy.

DEFOE BOAT & MOTOR WORKS
Bay City, Mich.

New Construction:

Hull No. 167, PC452, sub-chaser for U. S. Navy. 174' long. Delivery date May, 1941.

Hulls Nos. 168-170, YT149-YT151, three harbor tugs for U. S. Navy. 100' long. Delivery date February, 1941.

Hulls Nos. 171-174, four mine sweepers for U. S. Navy. 220' long.

THE DRAVO CORPORATION
Engineering Works Division

Pittsburgh, Pa., and Wilmington, Del.

New Construction:

Hulls Nos. 1699-1701, three welded car-floats for Pennsylvania R. R., Philadelphia, Pa. 250' x 34' x 9'1"; 1782 gross tons.

Hulls Nos. 1740-1749, ten type W-7 welded coal barges for stock. 175' x 26' x 10'8"; 4720 gross tons.

Hull No. 1750, 1300-hp twin-screw diesel towboat for stock. 176' x 36' x 10'; 590 gross tons.

Hull No. 1751, 760-hp twin-screw diesel towboat for stock. 145' x 27' x 11'9"; 318 gross tons.

Hulls Nos. 1757-1759, three welded coal barges for M. & J. Tracy, Inc., New York City. 134' x 34' x 17'; 2301 gross tons.

Hulls Nos. 1764-1767, four welded sand and gravel barges for Warner Co., Philadelphia, Pa. 130' x 34' x 10'; 1808 gross tons.

Hulls Nos. 1768-1775, three steel lighters for U. S. Navy Dept., Washington, D. C. 110' x 34' x 11'3"; 2672 gross tons.

Hulls Nos. 1776-1780, five covered cargo barges for stock. 175' x 26' x 11'; 2650 gross tons.

Hulls Nos. 1781-1784, four covered cargo barges for River Terminals Corp., New Orleans. 2612 gross tons.

Hulls Nos. 1785-1790, six sand and gravel barges for Keystone Sand Division. 135' x 27' x 8'; 1530 gross tons.

Hulls Nos. 1791-1795, five covered cargo barges for stock. 175' x 26' x 11'; 2650 gross tons.

Hull No. 1796, deck barge for Arundel Corp., Baltimore, Md. 110' x 34' x 11'3"; 334 gross tons.

Hulls Nos. 1797-1814, eighteen gate vessels for Bureau S. & A., Navy Dept., Washington, D. C. 5580 gross tons.

Hull No. 1815, one fabricated steel hull oil barge for Pacific D. D. & Repair, San Francisco, Calif. 195' x 35' x 9'9"; 598 gross tons.

ELECTRIC BOAT CO.
Groton, Conn.

New Construction:

Hull No. 38, Mackerel (SS204). Standard displacement 800 tons. Launched September 28, 1940.

Hull No. 39, Gar (SS206). Standard displacement 1475 tons. Launched November 7, 1940.

Hull No. 40, Grampus (SS207). Standard displacement 1475 tons. Keel laid February 14, 1940.

Hull No. 41, Grayback (SS208). Standard displacement 1475 tons. Keel laid April 3, 1940.

Hull No. 42, Gato (SS212). Standard displacement 1500 tons. Keel laid October 5, 1940.

Hull No. 43, Greenling (SS213). Keel laid November 12, 1940.

Hull No. 44, Grouper (SS214). Keel laying date December 28, 1940.

Hulls Nos. 45 to 57 (SS215-SS221; SS253-SS258). Standard displacement 1500 tons.

Hulls Nos. 58-82. Standard displacement 1500 tons.

GULF SHIPBUILDING CORP.
Chickasaw, Ala.

New Construction:

Four 2100-ton destroyers for U. S. Navy.

Four vessels for Waterman Steamship Corporation. 445′ x 63′ x 40′6″; shelter deck type; geared turbine drive; 15½ knots service speed.

GULFPORT BOILER & WELDING WORKS, INC.
Port Arthur, Texas

New Construction:

Hull No. 157, diesel tug for U. S. Navy. 70′ x 18′ x 10′3″; 400-hp Atlas diesel and auxiliary. **Delivery date December 15, 1940.**

Hulls Nos. 167-168, two diesel-electric tugs for General Motors Corp. 100′ x 24′ x 12′4″; 1000 shp G. M. diesel and auxiliary each. Delivery dates, No. 167, March, 1941; No. 168, April, 1941.

Hull No. 176, diesel tug for stock. 100′ x 24′ x 12′4″; 680 hp.

Hull No. 177, diesel tug for Deepwater Oil Terminals Co., Houston, Tex. 70′ x 18′ x 10′5″; 400 hp.

Hull No. 178, diesel tug for stock. 70′ x 18′ x 10′3″; 400 hp.

THE FEDERAL SHIPBUILDING AND DRY DOCK COMPANY
Kearny, N. J.

New Construction:

Hull No. 167, C-3 cargo vessel for U. S. Maritime Commission. Launched November 16, 1940.

Hulls Nos. 168-169, CL51, Atlanta; and CL52, Juneau; two 6000-ton cruisers for U. S. Navy. Keels laid April 22 and May 27, 1940.

Hulls Nos. 170, Edison; and 171, Ericsson; two torpedo boat destroyers for U. S. Navy. Launched November 23, 1940.

Hulls Nos. 174-176, three C-1 cargo vessels for U. S. Maritime Commission. **Launching dates,** Nos. 174-175, November 2, 1940; **No. 176, December 20, 1940.**

Hulls Nos. 179-186, eight C-2 cargo ships for U. S. Maritime Commission.

Hulls Nos. 187-188, two cargo vessels for Matson Navigation Co. Keels laid November 12 and 25, 1940.

Hull No. 189, one tanker for Pan American Petroleum and Transport Co. 13,000 dwt tons. Keel laid October 10, 1940.

Hulls Nos. 190-193, four tankers for Sinclair Refining Co. 15,000 dwt. Keel laid, No. 190, November 12, 1940.

Hulls Nos. 194-197, four destroyers for U. S. Navy. Keels laid, Nos. 194-195, December 2, 1940.

Hulls Nos. 198-203, six destroyers for U. S. Navy.

Hulls Nos. 204-205, two destroyers for U. S. Navy.

Hulls Nos. 206-213, eight destroyers for U. S. Navy.

Hulls Nos. 214-218, five destroyers for U. S. Navy.

Hulls Nos. 219-223, five cruisers for U. S. Navy.

Hulls Nos. 224-225, two destroyers for U. S. Navy.

Hulls Nos. 226-227, two destroyers for U. S. Navy.

THE INGALLS SHIPBUILDING CORP.
Pascagoula, Miss., and Decatur, Ala.

New Construction:

Hulls Nos. 254 to 256; three C-3 cargo vessels. Completion dates January, March and May, 1941.

Hulls Nos. 268, 297, 298, three C-3 IN passenger and cargo vessels for U. S. Lines.

One oil tanker for Husky Transit Corp., Minneapolis, Minn. 235′ x 35′ x 14′. **Estimated completion date January 3, 1941.**

Three steam turbine vessels for American-South African Lines. 492′ long, 69′6″ beam; 9500 shp; 18,000 ton dis.; 19 knots speed.

Hulls Nos. 265-267, three C-3-P cargo and passenger vessels for American-South African Lines. 492′ x 69′6″; 9500 shp; 18,000 tons dis.; 16½ knots speed. Completion dates November 15 and December 16, 1941; and January 15, 1942.

Hulls Nos. 283, 294-296, four C-3-S-A1 cargo vessels for U. S. Maritime Commission. Completion dates February 17, March 29, May 8 and June 17, 1942.

Three oil barges for Tropical Oil Co. 125′ x 30′ x 7′. **Completion date December 1, 1940.**

One oil barge for Goyer Oil Co., Greenville, Miss. 135′ x 33′ x 7′9″. **Completion date January 15, 1941.**

LEVINGSTON SHIPBUILDING CO.
Orange, Texas

New Construction:

Hull No. 155, tug for Higman Towing Co. 85′ x 24′ x 9′11″; 600-hp diesel.

Hull No. 160, tug for General Motors Corp. 85′ x 22′ x 9′; 800-hp diesel.

Hulls Nos. 186 and 190, two tugs for stock. 74′ x 20′ x 9′1½″; 400-hp diesel.

Hulls Nos. 187-188, two tugs for River Terminals Corp. 85′ x 23′ x 9′6″; 600-hp diesels.

Hulls Nos. 189 and 191, two 13,000-bbl oil barges for stock. 205′ x 40′ x 9′6″ x 10′10″.

Hulls Nos. 192-193, two 8,600 bbl oil barges for stock. 173′ x 39′ x 8′6″.

(Page 101, please)

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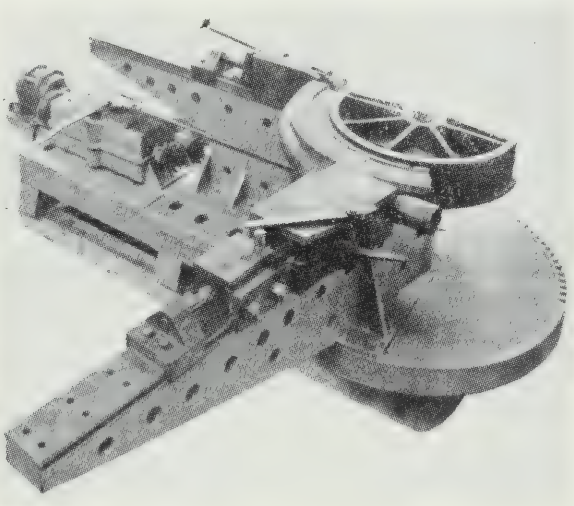

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Steady As You Go

(Continued from page 77)

are to be used. They are below the beam ends and may be above the clamp. They are bolted to the beams and to the clamp.

Pointers are diagonal fore-and-aft timbers connecting the stem and stern frame with the fore and after body. They are fitted inside the ceiling diagonally from the deck down to the bottom of the stem and stern, and fastened through the ceiling and the frames with ¾- to ⅞-inch clinched bolts.

QUESTION

3. Give the principal timbers and their scantlings for a vessel of the following dimensions: Length between perpendiculars 300 feet, extreme breadth 48 feet, hold depth 25 feet.

ANSWER

Floors	12″ x 16″
Frames	12″ x 16″
Keel	20″ x 24″
False keel or shoe	4″ x 20″
Garboards	11″ x 18″
Planking	5″ x 8″ or 5″ x 10″
Ceiling	10″ x 16″
Ceiling over bilges	14″ x 14″
Beams	14″ x 16″
Keelson group (5 to 9 timbers)	20″ x 20″
Stem	16″ x 20″
Apron	16″ x 16″
Stern post	16″ x 24″
Rudder post	16″ x 18″

Note: There is a reasonably wide difference of opinion as regards wooden ship construction, and particularly as regards scantlings and structural arrangements. It is suggested that you obtain a copy of "Rules for Building Wooden Ships" from the American Bureau of Shipping.

QUESTION

4. How are treenails arranged to prevent backing out where they do not go through?

ANSWER

Before starting to drive, the end is slightly opened with a chisel and a wedge is started, so that when the treenail is driven to the bottom of the hole, the wedge will be forced in and thus prevent backing out.

QUESTION

5. How would you strengthen the hull of an existing wooden vessel?

ANSWER

This has never successfully been done, but it might be possible to put new ceiling in the vessel of the full scantling size for a vessel of the dimensions and edge fasten it clear to the ends and through fasten it to the old ceiling with clinched bolts.

QUESTION

6. How would you prevent hogging and sagging in a wooden vessel?

ANSWER

Build the vessel up to the full strength of the American Bureau of Shipping rules and edge fasten the ceiling from top to bottom and carry the edge fastening clear to the ends of the vessel.

QUESTION

7. Draw the stem of a wooden vessel; show fastenings and name all adjoining parts.

ANSWER

See sketch.

QUESTION

8. Draw a midship section of a wooden vessel, showing all the adjoining parts.

ANSWER

See sketch.

Pacific Northwest Marine Review

(Continued from page 81)

The tug Tyee, one of the oldest and best known units of the Northwest towing fleet, was lost in the breakers off Tillamook Bar recently. She was formerly owned by the Puget Sound Tugboat Co., but more recently by the Hubble Towboat Co.

Leading other Coast districts, Washington's export trade in October, valued at $12,346,744, topped California and Oregon ports for the second time in 1940, according to Philip M. Crawford, Seattle office of the Bureau of Foreign and Domestic Commerce. Exports for the month were more than $4,500,000 greater than those of October, 1939.

The oil industry is looking forward with interest to the placing in service of the new Standard Oil tanker M. E. Lombardi, built to service the shallow-bar ports along the coasts of Oregon, Washington, California and Alaska. With a recent shortage of tanker service to North Pacific ports, additional facilities are especially welcome at this time, when oil users have once or twice been near an actual oil shortage.

Averaging better than 330,000,000 board feet per month, water-borne shipments of lumber from the Pacific Northwest for the first nine months of 1940 totaled 3,362,815,881 feet. This high total was reached despite a market decline in shipments to California ports occasioned by the steam schooner tie-up.

To distinguish workers according to their crafts, a new system has been adopted by the Seattle and Tacoma plants of the Seattle-Tacoma Shipbuilding Corp. The safety helmets of the workers are colored, each craft having a separate and distinct color. For instance, laborers wear red-lead hats, machinists buff, safety men red, riggers aluminum, etc. Officials of the company state that the colors enable the bosses quickly to pick out workers and thus speed work and efficiency.

Leaving Seattle on December 10 on the first leg of a 22,000-mile journey to the Antarctic, the motorship North Star of the Bureau of Indian Affairs will make her first stop at Honolulu. She sailed under the command of Capt. Isak Lystad, who commanded the ship on the similar cruise she made in 1939, when Capt. S. T. L. Whitlam, her regular commander, was taken ill just before the vessel sailed. She is carrying supplies to the Admiral Richard E. Byrd Antarctic Expedition, and will bring back most of the party on the return trip. It is understood that 58 members of the party from two bases in Little America will be landed in Seattle in April. The North Star, prior to her departure, was thoroughly overhauled at the Lake Union Drydock to fit her for the long trip to the South Polar region, after a strenuous summer season in the far north.

Hulls Nos. 194-195, two tugs for stock. 65′ x 17′ x 7′7″; 300-hp diesels.

Twenty-four 30-foot surf landing boats for U. S. Navy.

MANITOWOC SHIP BUILDING CO.
Manitowoc, Wis.

New Construction:

One steel twin-screw carferry. 406′ x 57′ x 23.5′. **Approximate delivery date, January 4, 1941.**

JOHN H. MATHIS CO.
Camden, N. J.

New Construction:

Four anti-submarine net tenders for U. S. Navy.

One bulk carrier tanker 265′ long for Thos. Bowes, N. A.

THE NEW YORK SHIPBUILDING CORPORATION
Camden, N. J.

New Construction:

AV4, Curtiss, seaplane tender for U. S. Navy. Launched April 20, 1940.

AV5, Albemarle, seaplane tender for U. S. Navy. Keel laid June 12, 1939.

BB57, South Dakota, battleship for U. S. Navy. Keel laid July 5, 1939.

AR5, Vulcan, repair ship for U. S. Navy. Keel laid December 26, 1939.

CL55, Cleveland; and CL56, Columbia; two cruisers for U. S. Navy. Order placed March 23, 1940.

CL57 and CL58, two cruisers for U. S. Navy. Order placed June 12, 1940.

AV7, Currituck, seaplane tender for U. S. Navy.

CL59-CL61, three cruisers for U. S. Navy.

CB1-CB6, six cruisers for U. S. Navy.

CL76, four cruisers for U. S. Navy.

NEWPORT NEWS SHIPBUILDING & DRYDOCK CO.
Newport News, Va.

New Construction:

Hull No. 372. Sold to U. S. Navy for conversion to naval auxiliary. Gross tonnage about 11,500 tons; LBP 525′, breadth molded 75′, depth molded 39′. Launched September 18, 1940.

Hull No. 378, battleship 58, Indiana, for U. S. Navy. Keel laid November 20, 1939.

Hulls Nos. 379-384, six single screw combination passenger and cargo vessels for U. S. Maritime Commission. 465′ x 69′6″ x 42′6″; gross tonnage about 9100 tons. Keels laid, No. 382, February 5, 1940; No. 383, June 10, 1940; No. 384, August 12, 1940. Launching dates, No. 379, June 7, 1940; No. 380, August 7, 1940; No. 381, October 4, 1940; No. 382, November 20, 1940.

Hull No. 385, aircraft carrier No. 8, Hornet, for U. S. Navy. **Launched December 14, 1940.**

Hull No. 386, single-screw combination passenger and cargo vessel for U. S. Maritime Commission. 465′ x 69′6″ x 42′6″; gross tonnage about 9100 tons. Delivery date May, 1941.

Hulls Nos. 387-388, two single-screw cargo vessels for Matson Navigation Co. 465′ x 69′6″ x 42′6″; gross tonnage about 7,700. Keel laid, No. 387, August 12, 1940. Delivery dates May 25 and July 1, 1941.

Hull No. 389, one single-screw cargo vessel for International Freighting Corp., Inc. 435′ x 63′ x 40′6″; gross tonnage about 8,000. Delivery date August 1, 1941.

Hulls Nos. 390-391 (CL62-CL63), two light cruisers for U. S. Navy.

Hulls Nos. 392-394 (CV9-CV11), three aircraft carriers for U. S. Navy.

Hulls Nos. 395-398 (CV12-CV15), four aircraft carriers for U. S. Navy.

Hulls Nos. 399-400 (CL80-CL81), two light cruisers for U. S. Navy.

PORTSMOUTH NAVY YARD
Portsmouth, N. H.

New Construction:

Submarines SS201, Triton; SS202, Trout; SS209, Grayling; SS210, Grenadier; SS205, Marlin; SS228-SS235.

THE PUSEY & JONES CORP.
Wilmington, Del.

New Construction:

Hull No. 1074, automobile and passenger ferry for Virginia Ferry Corp. 300′ x 65′ x 20′; 1600 gross tons; steam Una-Flow propulsion; 3600 hp; 16 knots speed; cost $1,000,000. **Delivery date December 30, 1940.**

Hulls Nos. 1075 and 1076, two C-1 cargo vessels for U. S. Maritime Commission; 413′ x 60′ x 37′6″; 5000 gross tons; turbine propulsion; 4000 hp; 14 knots speed; cost $1,928,000. **Delivery dates January 15 and March, 1941.**

Hull No. 1079, tug for Long Island R. R. Co. 105′ x 24′ x 12′11″; 210 gross tons; Una-Flow steam machinery; 800 shp; 11 knots speed. **Delivery date December 16, 1940.**

Hulls Nos. 1080-1081, two automobile and passenger ferries for Delaware-New Jersey Ferry Co. 206′ x 65′ x 16′; 750 gross tons; Una-Flow steam machinery; 1400 shp; 15 mph speed. Launching date February 1, 1941.

(Page 104, please)

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War and Marine Insurance

(Continued from page 88)

In order to protect American foreign trade, underwriters in this country organized the American Cargo War Risk Reinsurance Exchange. With few exceptions, all companies here licensed to do marine insurance and willing to write war risk insurance participated in the organization of this exchange, which affords to American shippers adequate war risk facilities. In Great Britain, the government is writing war risk insurance to or from Great Britain, its colonies and possessions on United Kingdom or neutral vessels. Such facilities are additional to those provided by Lloyd's and British companies for writing war risk insurance on cargo.

Protection and Indemnity

Protection and Indemnity insurance, which covers shipowners' liabilities, is also affected by war conditions. There is to be considered the increase in value and tonnage of cargo.

Speeding up of operations to take care of expanding volume of business, and more overtime wages, are likely to increase the number and size of payments for injuries. Provisions of contracts of employment have compelled owners to provide so-called crew insurance, which protects against personal injury and death to the officers and crews of ships caused by war perils. During the World War this coverage had been written by the War Risk Bureau of the government, but not by private underwriters. Underwriters have now adopted the form used by the United States government, and the insurance is now procurable through the usual protection and indemnity markets. For the benefit of their American policyholders, British Protection and Indemnity Clubs have taken steps to set up an American trust fund in amount of $500,000.

Conclusion

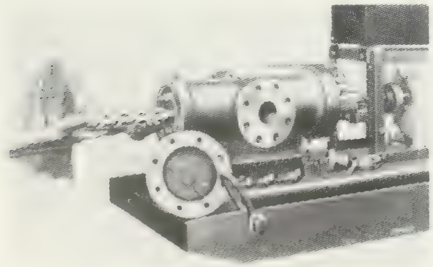
Each new major war has presented new and unforeseen problems. It is not unlikely that this present war will have its full share. As conditions change, and new problems are therefore presented, these facilities will change and perhaps be even further expanded to provide shipowners and merchants with their insurance requirements.

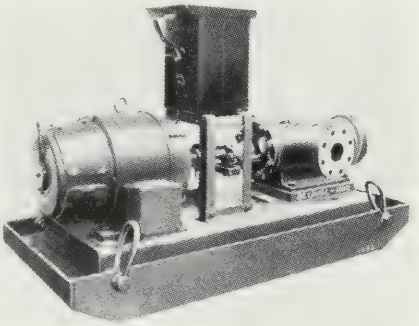
Paper read before the Port of San Francisco Propeller Club, December 3, 1940.

Portable Oil Pumping Unit

Cargo tanks for carrying edible oils, such as cottonseed oil, cocoanut oil, etc., have been fitted in the five new C-1 ships built for Lykes Bros. Steamship Co., Inc., by the Federal Shipbuilding and Dry Dock Co. The installation of permanent piping and pumps on board for emptying these tanks would have presented difficulties in space and arrangement, and also, in some cases, would have involved cleansing operations after each period of use.

Four portable, motor-driven oil pumping units, as shown in the accompanying illustrations, have therefore been purchased, two to be kept on each of two docks. When the oil cargo is to be discharged, the pump is lowered into the hold and connected to the cargo tank by flexible hose. The oil is delivered overboard by the pump through a flexible discharge hose to tank trucks or cars on the dock.





The pump is of the IMO design, manufactured by the De Laval Steam Turbine Co., Trenton, N. J., and has only three moving parts, a power rotor and two idler rotors. The specially-formed helical threads of the rotors mesh in such a way that the oil is propelled forward, as by a continuously moving piston, without shock or pulsation, and without trapping of oil. There are no valves or timing gears, and, as the moving parts are in perfect rotational balance, operation is free from noise or vibration. The only stuffing box, that of the extended spindle of the power rotor, is under suction pressure only. Upon removing one of the heads of the pump and disconnecting the coupling half, the three rotors can be withdrawn from the end of the pump.

Time Signal Clocks

The new synchronous program clocks for operating time signals are now being manufactured by Zenith Electric Company, 845 South Wabash Avenue, Chicago, Illinois. Type P 512 will operate a signal at any five-minute period, and Type PD 124 will operate a signal at any one-minute period.

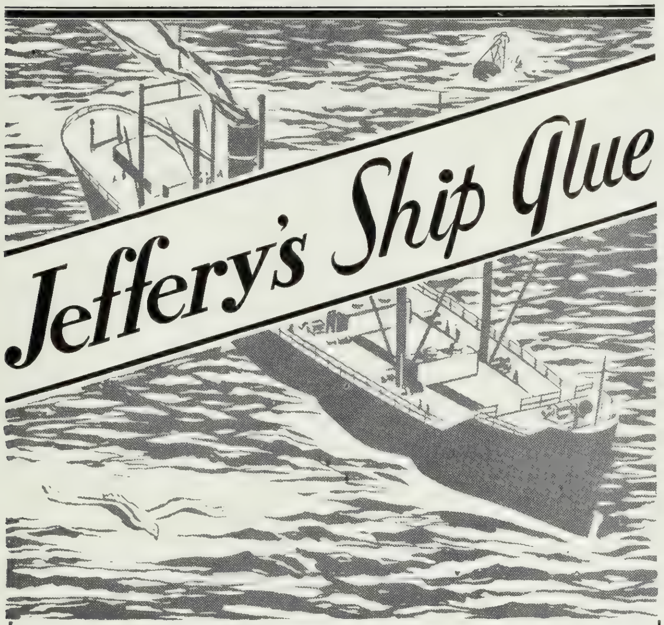
These clocks have a large, legible 24-hour dial and a 1-hour dial cam. Pointers, connected to a contact arm, ride the dials and permit the contact arm to fall only when preset time is reached.

These units are operated by heavy duty synchronous motors, and contact arrangements are such that absolute accuracy is assured. Contact can be so arranged as to operate a signal either in one ring or a coded ring, or for a definite duration of time, from 2 to 6 seconds. Units are compact, and are enclosed in dust-proof case. These clocks can be built to operate for many different purposes, such as daily siren testing, timing industrial processes and signaling the start and end of operating periods.

Massachusetts Nautical School Graduates

Twenty-seven cadets graduated in the October, 1940, class of the Massachusetts Nautical School. Of this twenty-seven, all but six obtained positions either on American vessels or in American shipyards. Of these six, five are doing post graduate work.

Twenty-one graduates of the Massachusetts Nautical School, cadet officers under the U. S. Maritime Commission, have since July 1, 1940, received active duty orders as ensigns, Merchant Marine Naval Reserve, and have been assigned to Navy ships.



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Progress in American Shipyards

(Continued from page 101)

SUN SHIPBUILDING AND DRY DOCK COMPANY

Chester, Pa.

New Construction:

Hulls No. 186, Rio Hudson; No. 187, Rio Parana; No. 188, Dio de la Plata; No. 189, Rio de Janeiro; four C-3 cargo and passenger liners for Moore-McCormack Lines. 492′ x 69′6″ x 42′6″; 8500 gross tons; diesel propelled; 8500 shp; 16½ knots. Delivery dates, August, September, October and November, 1941.

Hulls Nos. 199-200, two C-2 cargo vessels for American Mail Line. 474′ x 63′ x 40′6″; 7400 gross tons; diesel propelled; 7500 shp; 16 knots. Delivery dates, June and July, 1941.

Hull No. 207, Esso Williamsburg, tanker for Panama Transport Co. 547′3″ x 70′ x 40′; 11,300 gross tons; diesel propelled; 7500 shp; 15 knots. Delivery date, April, 1941.

Hull No. 208, tanker for Petroleum Shipping Co. 520′ x 68′ x 37′; 10,400 gross tons; turbine; 4000 shp; 13 knots. Delivery date, May, 1941.

Hull No. 211, tanker for Atlantic Refining Co. 543′10″ x 70′ x 40′; 11,600 gross tons; turbo-electric; 5000 shp; 13 knots. Delivery date, April, 1941.

Hull No. 212, tanker for Sun Oil Co. 547′3″ x 70′ x 40′; 11,300 gross tons; diesel propelled; 7500 shp; 15 knots. Delivery date, March, 1941.

Hulls Nos. 213-220, eight tankers for Panama Transport Co. 547′3″ x 70′ x 40′; 11,400 gross tons; 7500 shp; 15 knots speed.

Hulls Nos. 221-222, two tankers for Keystone Tankship Corp. 520′ x 68′ x 37′; 10,600 gross tons; turbine; 12,000 shp; 16½ knots. Keel laying dates, November 15 and December 15, 1941. Launching dates, June 15 and July 15, 1942.

Hulls Nos. 223-225, three tankers for The Texas Co. 513′10″ x 68′ x 36′; 9300 gross tons; turbine; 9000 shp; 16 knots.

Hull No. 226, tanker for Kaymar Tankship Corp. 520′ x 68′ x 37′; 10,600 gross tons; turbine; 12,000 shp; 16½ knots. Keel laying date, April 5, 1942. Launching date, August 28, 1942. Delivery date, November, 1942.

Hulls Nos. 227-228, two tankers for Seamar Tankship Corp. 520′ x 68′ x 37′; 10,600 gross tons; turbine; 12,000 shp; 16½ knots. Keel laying dates, May 5 and June 5, 1942. Launching dates, September 28 and October 28, 1942. Delivery dates, December, 1942, and January, 1943.

Hull No. 229, tanker for Atlantic Refining Co. 543′10″ x 70′ x 40′; 11,600 gross tons; turbo-electric; 5000 shp; 13 knots.

Hull No. 230, tanker for Atlantic Refining Co. 474′ x 65′ x 37′; 8000 gross tons; turbo-electric; 5000 shp; 14½ knots.

Hulls Nos. 231-233, three tankers for Keystone Tankship Corp. 520′ x 68′ x 37′; 10,600 gross tons; turbine; 12,000 shp; 16½ knots.

Hull No. 234, tanker for Sun Oil Co. 547′3″ x 70′ x 40′; 11,400 gross tons; diesel propelled; 7500 shp; 15 knots.

Hull No. 235, tanker for Standard Oil Co. of N. J. 547′3″ x 70′ x 40′; 11,400 gross tons; turbine; 7500 shp; 15 knots.

Hull No. 236, tanker for Atlantic Refining Co. 543′10″ x 70′ x 40′; 11,600 gross tons; turbo-electric; 5000 shp; 13 knots.

TAMPA SHIPBUILDING CO.

Tampa, Fla.

New Construction:

Hulls Nos. 35-36, two C-2 type cargo vessels for U. S. Maritime Commission. 459′ x 63′ x 31′6″; 9291 dwt tons; diesel powered. **Delivery dates, No. 35, January, 1941;** No. 36, March, 1941.

Hulls Nos. 37-40, four C-2 type cargo vessels for U. S. Maritime Commission. 459′ x 63′ x 31′6″; 9291 dwt tons.

TODD-BATH SHIPBUILDING CORP.

Bath, Maine.

New Construction:

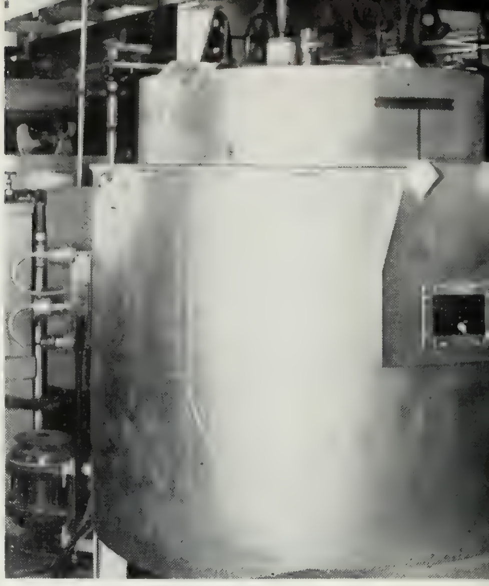
Thirty cargo vessels for British Purchasing Commission. Cost $50,000,000.

G. E. Electric Gas-Carburizing Furnace

A new gas-carburizing electric furnace for case-hardening steel parts has been announced by the General Electric Company, Schenectady, N. Y. This new furnace offers outstanding advantages over other methods of carburization. A hydrocarbon gas, circulated rapidly through the charge, is used instead of a solid carbon compound as a source of carbon for the carburizing process. Since the gas is uniformly distributed in the furnace, a "case" of uniform thickness forms on every surface, regardless of position in the load. In addition, like all electrically-heated devices, the furnace can be controlled automatically to reproduce any carburizing treatment, time after time, on a production-line basis.

Operating data show that savings as high as 75 and 80 per cent are made under some conditions when this gas-carburizing furnace is substituted for older methods of carburizing. These savings are possible because of the shortened carburizing cycle, the elimination of packing material and the improvement in quality and uniformity of carburized parts obtained by the new furnace.

In the new furnace, propane, a hydrocarbon gas, is substituted for the solid packing compound used in most furnaces. The gas is passed into the chamber through an inlet located in the bottom of the retort at the periphery of the circulating fan. The amount of carbon in the furnace is controlled by measured regulation of the flow of gas. The fan, which is made of heat-resisting alloy, is driven by an easily-accessible standard induction motor. The rapid circulation of the gas assures quick heating and uniform temperature distribution. Parts in the charge reach the carburizing temperature much more rapidly in the new furnace than in pack-carburizing furnaces, because there is no packing material to absorb or waste the heat.



New Canvas Cement

There is now on the market, announced by L. W. Ferdinand and Co. of Boston, Massachusetts, a double-duty product known as Ferdico Canvas Cement for cementing canvas for cabin tops, decks, hatch covers and other exposed ship surfaces. This product has the particular advantage of also being a filler to be used on the outer surface of the canvas before painting. Used in this way, the cement prevents "alligator cracks" and results in greater economy. Two coats of filler and one coat of paint make a surface of greater strength and longer life than any other method in present use. It also permits the use of a lighter-weight canvas, thus making for still greater economy.

When canvas-covered surfaces, such as boat decks, cabin tops, canoes, trailer tops, porch roofs and floors become shabby from wear and weather, here is a simple and efficient way to make durable repairs:

First, cement a thin piece of unbleached sheeting or muslin over the old canvas. Second, use this same cement as a filler on top of the sheeting. Third, cover the surface with a coat of paint. In using Ferdico canvas cement as a filler, the surface may be left rough; or, if preferred, it may be sanded down to a glossy smoothness.

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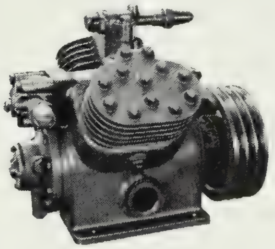

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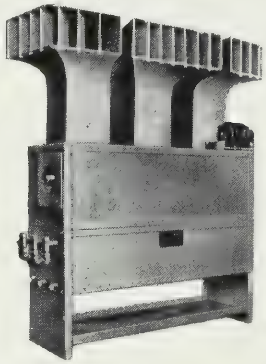

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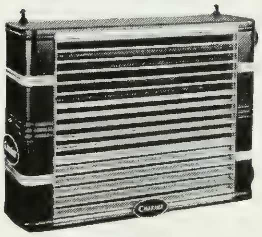

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HYDROGRAPHIC OFFICE ANNIVERSARY

December, 1940, marked the one hundred and tenth anniversary of the Hydrographic Office of the U. S. Navy Department, which was first organized as a Depot of Charts and Instruments on December 6, 1830. A brief account of the history of this office was published in connection with its annual report for 1940, and the following is an extract from that account:

On December 6, 1830, a Depot of Charts and Instruments was established under the Navy Department in the District of Columbia. The purpose of this depot was to acquire and issue to naval ships equipment necessary for navigational purposes. A 30-inch transit instrument was mounted for use is ascertaining the errors and rates on chronometers. This was the first astronomical instrument erected by the U. S. Navy.

At this time, all charts and nautical books for the use of the Navy were purchased principally from several European sources. It was soon decided to modify the purchased charts to reduce them to one common prime meridian, that of Greenwich. In May, 1835, a press was installed at the Depot, and this marks the beginning of the work of chart production and original hydrographic operations by the U. S. Navy.

In 1837 four engraved charts, covering Georges Bank and vicinity, the first to be issued by the Navy, were published at the Depot from surveys made by naval officers. A portable 42″ telescope was installed, which proved to be the beginning of the present Naval Observatory. In 1844 a new depot was completed, and about the same time Lieut. Matthew Fontaine Maury was assigned as superintendent.

The researches and other activities of Maury comprise a bright chapter in the history of the Hydrographic Office. He may well be called the "Father of Modern Hydrography," as his works laid the foundation on which all present Hydrographic Offices are based. His collection of data on weather, temperatures, winds and currents was the means of enabling him to produce the "Wind and Current Charts" which are continued to this day under the designation "Pilot Charts." These charts were first issued in 1848.

Editorial Comment: Note this year 1848. It is a significant fact often overlooked in American maritime history that this work of Matthew Fontaine Maury in "finding the wind" was the real start in the "American clipper ship era." When a shipowner knew the course that would give him favorable winds, he could afford to build a sailing ship designed to take advantage of those winds, and fast sailers could turn in consistent performances. Practically all clipper ships took the courses indicated by the Maury charts and sailing directions, and in the great majority of voyages found the wind where indicated. This, combined with the additional fact that ships were then built at less cost in America than was possible in Europe (due to better and cheaper ship timber and lower wages), enabled the American shipowner to capture a large share of the carrying trade of the world for the period from 1850 to 1862.

Maury's researches also covered oceanography and physical geography as well as astronomy and meteorology. During the period this officer was in charge of the Depot, a number of charts were produced based on data obtained by the Ringold (Rodgers) North Pacific Surveying Expedition, and the Perry Expedition to Japan.

The outbreak of the Civil War cut short much of the survey and research work of the Depot, which had meanwhile become better known and generally regarded as the "Naval Observatory" or the "Naval Observatory and Hydrographical Office." In 1866 the Naval Observatory was separated from this combination and the Hydrographic Office established under that designation, which it has held to the present time.

The work of this office has grown steadily since its establishment. The "Hydrographic Notices" and " Notices to Mariners" were started in 1867 and 1869, respectively. The first Pilot Charts to be published under that name were printed in 1883.

Surveys of numerous islands in the Pacific were made in 1874, of the Amazon and Madeira Rivers in 1880 and the West Coast of Mexico in 1882. Other surveys were meanwhile conducted by regular naval vessels.

In 1890 regular appropriations were made for surveying by the Hydrographic Office under the title "Ocean and Lake Surveys." These have been continued annually since that time.

Branch Hydrographic Offices were established in five ports in 1884. At the present time, this number has increased to twenty. These offices, by direct contact with shipmasters of the merchant marine, collect and disseminate information of interest to the maritime world.

In 1894 a letter-engraving machine (Ourdan) was devised in the Hydrographic Office. This machine marked a great improvement over the hand engraving method, and, with modifications, is still in use today for chart engraving.

In 1912 the Hydrographic Office purchased and installed a lithographic offset press, using zinc plates, for the reproduction of charts. This is the first time such a press was used for this purpose. Other Hydrographic Offices soon followed in adopting the offset press, which is now in common use.

Printing from zinc plates facilitated the use of colors to a much greater extent

(Page 108, please)

SANDUSKY CENTRIFUGALLY CAST
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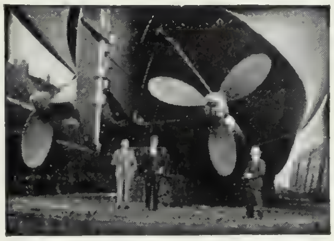

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The Steel Industry in America

by Irving C. Olds
Chairman of the Board, U. S. Steel

During recent months, the outstanding characteristic of the steel industry has been the consistently high rate of operations, ranging from around 70 per cent of rated ingot capacity in the first quarter of 1940 to more than 90 per cent in the last quarter, with an average ingot production for the year slightly in excess of 80 per cent of rated capacity. This country produced more steel in 1940 than in any previous year, exceeding the production of the record year of 1929 by a considerable amount.

After the low rates at which the steel industry has operated almost continuously since 1930, it is gratifying to witness such a substantial realization of this basic industry's vast resources, both in equipment and man power, but it must not be overlooked that the causes are transitory, tracing back to the war in Europe and to generally disturbed conditions in the world, and that readjustments will follow when a more peaceful day is reached.

Some commentators outside of the steel industry have questioned the adequacy of existing steel capacity to take care of demands during the present emergency. To date, the nation's defense effort has not been delayed by any shortage of steel, and no such delays from that cause are anticipated by the industry.

Present ingot capacity of the industry is about 60 per cent greater than the peak production in 1917—during the World War—and approximately 30 per cent greater than the ingot production of the record year of 1929.

The subsidiaries of United States Steel Corporation are now engaged in the execution of a carefully-considered program of plant improvement and extension. Expenditures of such subsidiaries during 1940 for improvements and extensions aggregated approximately $80,000,000, and at December 31, 1940, the unexpended balance on authorizations for this program amounts to approximately $155,000,000. Other steel companies have announced plans for substantial improvements and extensions in their facilities.

Extensive facilities have been or are now being installed at certain plants of subsidiaries of United States Steel Corporation for the production of heavy and light armor plate, shell forgings and unloaded shells and bombs, in order that these subsidiaries may perform contracts undertaken in connection with the National Defense Program. During the past year, facilities of the shipyard at Kearny, New Jersey, have been materially increased, and that yard is now busily engaged in the construction of vessels for the Navy and the Maritime Commission. A subsidiary is now operating under lease the Government's armor plate plant at South Charleston, West Virginia, which is being substantially enlarged.

We start the new year with a deep sense of responsibility. The proper utilization of the great energies and resources of the country can be attained only by the sustained and coordinated efforts of all in willing obedience to the obligation to make the public interest and public need paramount to all other interests and aims. United States Steel considers itself prepared to fulfill its part in this great national undertaking.

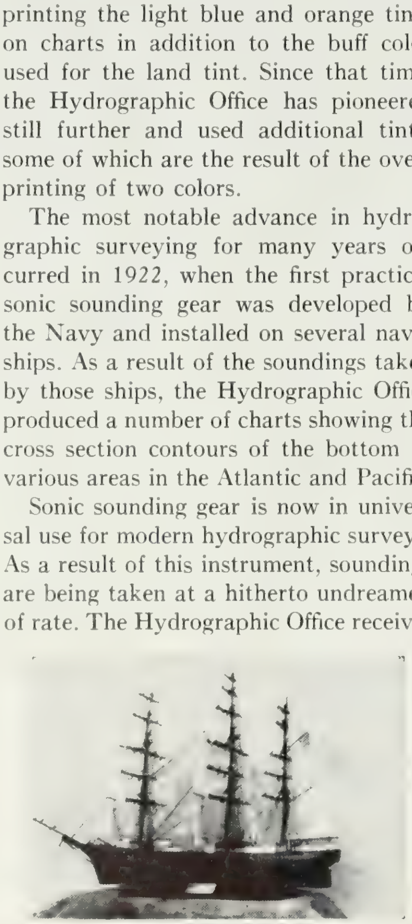
A Notable Century

(Continued from page 106)

than was possible with the old presses. As a result, the Hydrographic Office began printing the light blue and orange tints on charts in addition to the buff color used for the land tint. Since that time, the Hydrographic Office has pioneered still further and used additional tints, some of which are the result of the overprinting of two colors.

The most notable advance in hydrographic surveying for many years occurred in 1922, when the first practical sonic sounding gear was developed by the Navy and installed on several naval ships. As a result of the soundings taken by those ships, the Hydrographic Office produced a number of charts showing the cross section contours of the bottom of various areas in the Atlantic and Pacific.

Sonic sounding gear is now in universal use for modern hydrographic surveys. As a result of this instrument, soundings are being taken at a hitherto undreamed of rate. The Hydrographic Office receives annually about 100,000 sonic soundings.



In the same year (1922), the Hydrographic Office again set a new standard when it introduced the use of airplane mapping in connection with its hydrographic surveys. The use of photographs taken from planes has been considered a necessary part of Hydrographic Office surveying since that date, although the practice did not come into general use until some time later.

In 1923 the Pantograver, a machine which combines the features of the pantograph and engraving machine, and which compensates for distortion, was devised in the Hydrographic Office by two of its employees. This machine is considered to represent the greatest advance in the work of engraving on copper or glass for many years, and has resuted in great economies in time as well as cost.

Although none of the improvements and advances made in recent years approach in stature those mentioned above, numerous other improvements have been made and economies effected from time to time. The Hydrographic Office has always been the leader in its field, and almost without exception has either originated the important improvements or has been the first to adopt them when invented elsewhere.

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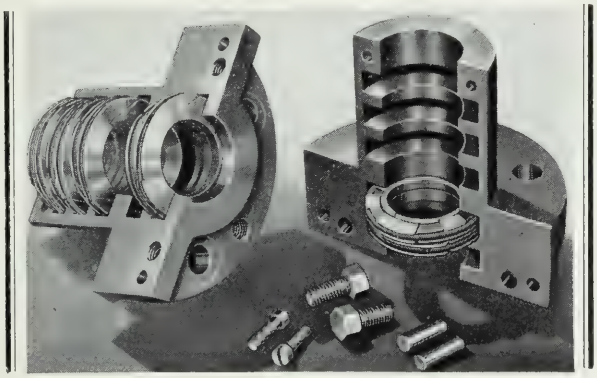

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News of the Trade

Caterpillar Tractor Co. has announced the appointment of **L. C. Allenbrand** as manager of the company's sales development division. Mr. Allenbrand succeeds **G. E. Spain,** who has been promoted general sales manager.

Mr. Allenbrand was born near King City, Missouri, and received his early training there. After attending the University of Missouri, he went to work for the John Deere Plow Company of Kansas City in 1923.

Mr. Allenbrand in April, 1931, came to Caterpillar Tractor Co. as a special representative in the general sales department. Within six months he was transferred to the sales training division, and in 1932 was made sales training representative for the Western Division of Caterpillar Tractor Co., with headquarters at San Leandro, California. He remained in that capacity until May of 1933, then he joined the organization of the Doyle Tractor and Equipment Co., Caterpillar distributor at Visalia, California.

Early in 1934 he returned to Caterpillar Tractor Co. at the Peoria, Illinois, factory as assistant manager of the sales training division. He has held that position until the present time, and in that capacity organized the company's annual diesel show program. During recent years he also organized and has conducted the company's program of sales meetings, which are held at distributors' offices throughout the United States and Canada.

Byers to Handle Steel

The 76-year-old A. M. Byers Company, long a leader in the manufacture of wrought iron, has announced that it soon will enlarge its activities to include the production of a broad line of alloy steels, including stainless.

The announcement was made by **L. F. Rains,** president, following action of the Board of Directors.

Production will begin within four to six months. An addition will be built to the company's Ambridge plant, and will be used as a melt shop for new electric furnace equipment that is to be installed. Other basic production equipment for heating and rolling alloys already is in existence within the plant, Mr. Rains states.

Initial products will be billets and bars for alloy steel fabricators.

"We have been contemplating for some time the advisability of entering into the manufacture of alloy steels, for which there has been a constantly growing market that does not conflict with our wrought iron business," said Mr. Rains.

"Promotion of wrought iron in present markets, and the development of new uses, is being carried on in an extremely aggressive and organized manner, so that we may be sure of our full share of business from this quarter, and in direct ratio to a rising tide of demand. Both from the standpoint of manufacturing as well as sales experience, our organization is well qualified to develop along specialty lines. We feel that we have reached a point in our corporate existence where the alloy steel business opens up new opportunities," he concluded.

Branch offices of the company are located at Boston, Chicago, Houston, New York, Philadelphia, San Francisco, St. Louis and Washington, D. C.

V. M. Friede, naval architect, who recently completed the design and supervision of the three new cargo-passenger vessels, S. S. Delbrasil, S. S. Delorleans and S. S. Deltargentino, for the Mississippi Shipping Company of New Orleans, has been retained by the company as their consulting naval architect.

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PACIFIC MARINE REVIEW

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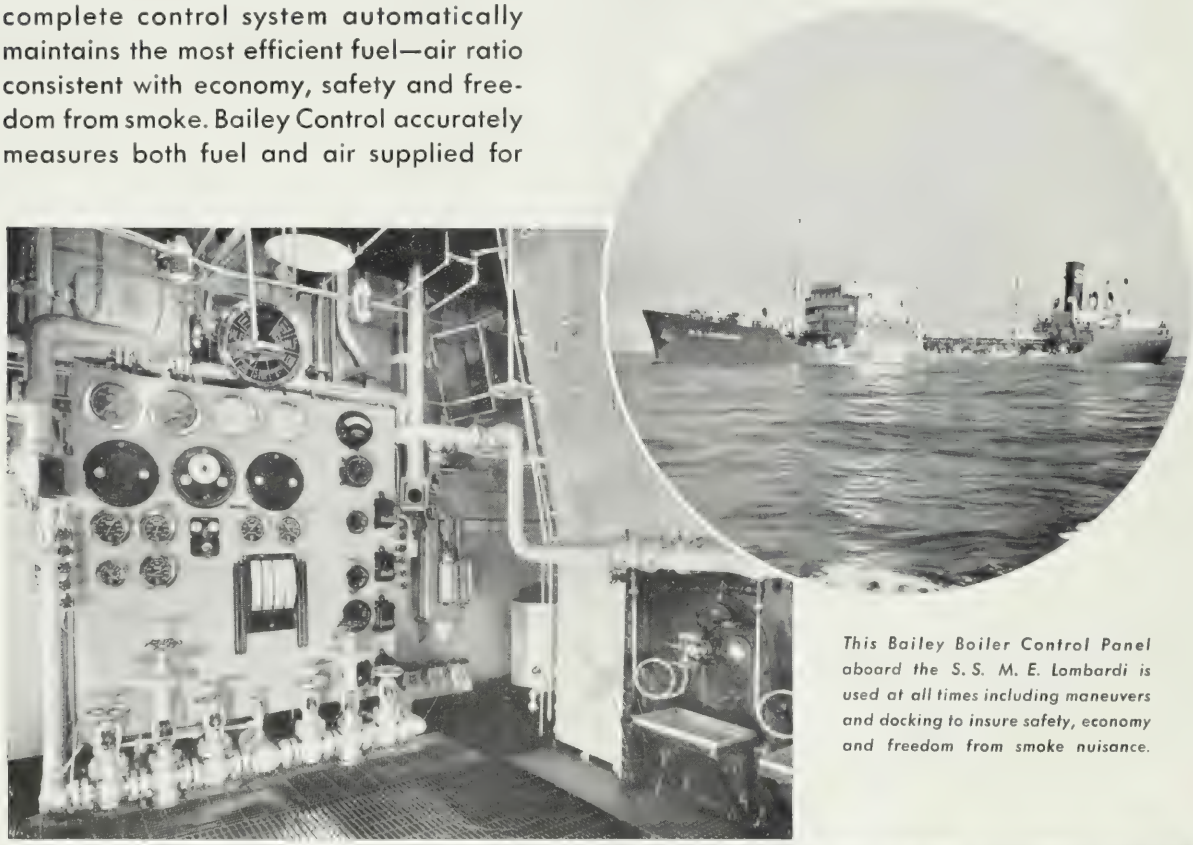

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No. 2

PACIFIC MARINE REVIEW

FEBRUARY
1941

Editorial Comment

Port Control at San Francisco

For many years PACIFIC MARINE REVIEW has advocated the return of the control of her port to the City and County of San Francisco. We are glad that now the community is becoming more unanimous in demanding this return.

Principal reason for the urgency of the present demand is the raising of rentals and of tolls by the State Board of Harbor Commissioners. This, acording to the various civic bodies interested, will drive commerce away from the port.

The center of San Francisco's waterfront is the Ferry Building. For two generations, the commuter traffic through this building has provided a very large share of the revenues of the port. These same civic bodies very enthusiastically take credit for promoting and building two bridges, and in order to assure the financial success of these bridges they actively put out of business the ferry system that supported the rents of the Ferry Building.

This action made the raising of port tolls and rents inevitable. Such short-sightedness is rather characteristic of San Francisco in a long list of dealings with the State of California and with Washington.

Turning the port over to the State was among the first instances of this failure to provide for the future. There should have been provision made in the act for the return of the port when San Francisco was ready to take it.

The Raker Act, the Golden Gate Bridge District, are later examples.

The principal reason for returning the port control to San Francisco is that the citizens of San Francisco may learn to take an interest in port matters.

Those portions of the bay and ocean coast line of the County of San Francisco that are under the jurisdiction of City and County commissions are very well managed, and will compare favorably in beauty and utility with similar city projects anywhere.

We believe that a city Port Commission would manage our waterfront well.

We know that to keep the tolls at a basic rate attractive to commerce will cost the citizens of San Francisco some additional taxes. These taxes will create an interest in the waterfront, and that is what is needed to make a really successful port.

San Francisco, awakened to its function as a shipping center, can become a truly great port city, promoting and financing international trade over all the seas.

National Defense and State Taxes

Claims of many California firms holding cost-plus-a-fixed-fee contracts with the Government in connection with the National Defense Program, that purchases of material by them to fulfill their contracts are not subject to the sales tax, have been rejected in a recent opinion by Attorney General Earl Warren, given to the State Board of Equalization, according to William G. Bonelli, fourth district member of the Board.

Contention of the contractors that in purchasing materials they are merely acting as purchasing agents for the Government, and therefore not required to pay the tax, governmental purchases being exempt from it, was overruled by Warren; his opinion, declaring that an effort to have the legislation authorizing the contracts include a clause establishing the status of contractors as purchasing agents, was voted down by Congress.

As the value of these contracts placed by the Government in Southern California amounts to many millions of dollars, with a proportionately large sum of sales tax revenue due the State from purchases made under them, Bonelli considers the attorney general's opinion of particular importance to all buying or selling under this type of contract. He urges their cooperation with the Board in its effort to collect the tax, now that its validity has been established.

In an accompanying opinion, Warren ruled that sales of motor vehicle fuel to the contractors is subject to the California gasoline tax.

Of course, these taxes become part of the cost and are passed on to the Federal National Defense Budget and so back to the people—all part of our very foolish merry-go-round of political spirals multiplying tax bills.

Two recent snaps on San Francisco waterfront

America's Shipping

by Rear Admiral Emory S. Land, U. S. N. (Ret.)

It is informative at times to walk out of the woods into a cleared patch and see that you are living in a forest rather than beside a couple of trees.

Standing out in that cleared patch, which happens to be the beautiful city of New Orleans at the moment, I have been trying to look at the problems of the merchant marine as a whole in "A world in flames."

With this world of ours in flames, a lot of things that were inert are changing, and changing rapidly. And of these, one of the most important to the peaceful citizens of the United States is their merchant marine. It is not your merchant marine or my merchant marine, and no part of it will be anybody's private property to do with as he likes until this emergency is well past. Many of you are already cooperating in the National Defense Program. Others know what may be demanded of you, and are ready. In their merchant marine, the people of this country have a service which has already joined the colors and which is ready and prepared to care for the interests of all the people.

The merchant marine is one of those services which has a dual function. In time of peace it serves the commerce of the nation; in time of emergency it serves the armed forces. It should be large enough to serve both; commerce must not stop even in an emergency. World developments have forced us against our will into a period of emergency, and the merchant ships of this country are now serving the Navy, the Army and the industrial plants which are building our weapons of defense.

A lot of things are called lifelines, but to none does the term apply as aptly as to ocean-going ships. That is where the lifeline was developed, where it is used today and where it brings out the real heroism of the men who follow the sea.

"A Hell of a Fix"

Where would this country be today if it did not have a strong merchant marine? Specifically, where would our Navy be without that merchant marine? To both of my questions I answer, "In a hell of a fix!" If you want to throw in a third question—where would our industries be?—it will get the same reply. And this goes once for those critics who said we were building too many ships, and it goes twice for those economists who prove (solely to their own satisfaction) that we do not need a merchant marine.

Preparedness is the key word of all the country's activities today. It is a wonderful thing to see men and women unselfishly giving their energies to this program. As Coordinator of Shipbuilding for the National Defense Advisory Commission, I have been able to see some important men making real sacrifices in this regard. I think America can be proud of the progress of this program for making it strong in every part of its system.

Merchant Shipping Prepared

One thing that is making it easier to do the herculean work of defense in other fields is the fact that it has already been well started in the merchant marine. The merchant marine is prepared to the limit of our available funds. It is prepared *today* for any duty which it may be asked to do. I won't say it is the only major industry which is prepared, but I will say that in all the worries that official Washington has had to go through in recent months in the preparedness program, it has not had to worry very much about shipping. Frankly, I don't believe official Washington has worried enough about the merchant marine. The defense program of the Maritime Commission is further along than any other comparable defense activity, but I am not satisfied that we are far enough along.

But the groundwork is prepared. In 1936, Congress passed a new Merchant Marine Act providing for the rebuilding of our merchant shipping for the joint purpose of fostering our commerce and aiding our national defense. In 1938, after finding that both these purposes would suffer under a fleet which was more than 90 per cent obsolete, we set out upon a building program—a program planned with both of these purposes in mind. Under that program, we have started 179 new ships, the first real addition to our merchant fleet since the end of the First World War. Of these 179, 84 have been launched and 56 are already in service. Ships are being launched at the rate of one a week and completed at the same rate.

As the international crisis became apparent in the summer of 1939, the Commission accelerated its program and awarded contracts for 67 ships in 42 days.

Lifeline

Dining room of round-the-world liner, American President Lines

Thus peacetime prices were obtained for what will be National Defense equipment in this emergency. Yet, on the other hand, this acceleration program did not glut the ship market. None of the Commission's new construction is lying around idle for want of a trade to put it in. Practically all of our new ships are either sold or chartered to private operators.

One of the things which makes these ships particularly valuable to us at this time is sinkings of foreign vessels. Another is the restricted use of ships of the maritime nations of the world due to blockades. Acknowledged merchant marine losses of allied and neutral countries up to the end of November were nearly four million tons. The British losses alone were not far from 2½ million tons. While new British construction plus the use of one and a half million tons of Norwegian, Dutch, Belgian and French ships made up for losses through the end of September, the British Minister of Shipping recently admitted that their shipyards can no longer equalize the losses. For a nation such as ours, which has recently been carrying less than a third of its own commerce, such a severe decline in world tonnage could be disastrous. Fortunately, it will not be for us.

When the emergency became acute, the Navy set out to acquire some of the merchant marine auxiliaries which it needed. Thus far the Navy has acquired a large number of merchant ships. Among them were 23 of the new vessels laid down by the Maritime Commission. And of these 23, 12 were the large, 19-knot, National Defense tankers which were the first unit of the Commission's program after the passenger ship America. Those 12 tankers will carry a total of more than 72,000,000 gallons of oil at a speed which will enable them to keep up with the battle fleet. Using battleship fuel consumption as a basis, those tankers will enable vessels of our fighting fleet to steam a total of more than 800,000 nautical miles without putting in at a naval base.

The Navy has taken seven of our C-2 type freighters which can make better than 17 knots and is using them as ammunition and cargo ships. It has taken four of our C-3 type freighters, which have operated at 19 knots, and is using them for submarine and seaplane tenders.

The quickness with which these vessels were acquired, and the rapidity with which they will be converted, are testaments to the careful planning of this program. A complete understanding has been had with the Navy Department from the inception. Designs were made with Navy needs in mind, and were approved by the Navy. Gun locations, accessibility of cargo spaces, compartmentation were all planned for naval use. Today the care which went into this designing and building is proving itself.

Personnel Training

In describing the merchant marine preparedness program of the last four years, it is impossible not to mention the training of merchant marine personnel which was begun by the Maritime Commission in 1938. That program, the details of which are known to most of you, has already begun to raise standards. Its value as a protection to lives of passengers and crew and to cargo has been demonstrated.

Today there are more than 600 young men being trained in shipboard service in the cadet program. More than 100 of the cadet officers have already been called to active duty by the Navy. All cadets are members of the Naval Reserve. In the Maritime Service, which trains experienced licensed and unlicensed personnel and apprentice seamen, there are 6,000 now enrolled. This is roughly ten per cent of the total employment on seagoing vessels.

"Total defense" requires that every man and woman do his job as efficiently as possible. Our seamen and officers are learning to do theirs efficiently, and are glad of the opportunity. Many are joining the Naval Reserve, still more are getting training in the use of anti-aircraft and broadside guns or learning the skill of radio communications. All are learning to work well so that they may safeguard that lifeline, both for themselves and their country.

Acquisition for Navy

As the nature of the emergency has become more clear in recent months, the Maritime Commission, in cooperation with private operators, has carried on several other preparedness activities which have rounded out its defense program. At the request of the Navy, it has handled the acquisition of merchant ships. Thirty-seven of these have been bought for the Navy, including the new construc-

(Page 63, please)

The break of the poop and the stack

S. S. M. E. Lombardi

A New Steam For Standard Oil

In January — there arrived in San Francisco the new steamer M. E. Lombardi, a tankship designed for specialized service by the Marine Department of the Standard Oil Company of California and built by the Sun Shipbuilding and Dry Dock Company of Chester, Pennsylvania. She was welcomed to her home port by a group of marine experts, who, after a survey of the vessel, gave her their enthusiastic endorsement.

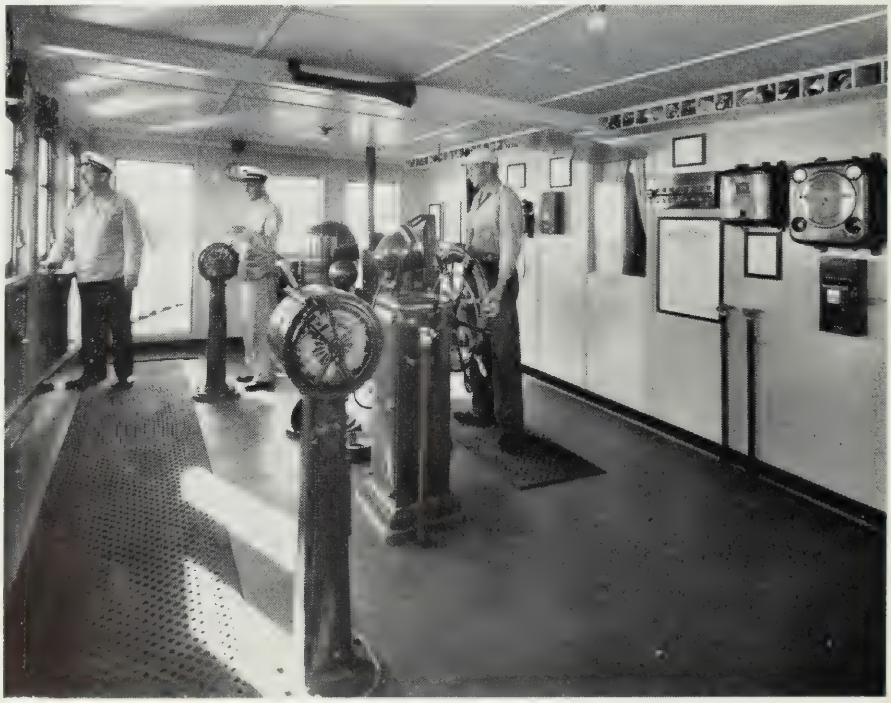
This vessel is the size of ship that most old-timers like for a seagoing hull. Not a large tanker as modern tankers go, but a medium-sized ship, she was designed and built for delivery of various Standard Oil products in bulk to the smaller ports of the Pacific Coast from Mexico to Alaska, and for occasional trips transpacific to the smaller island ports, such as Guam or Midway.

Her characteristics are given in the table herewith.

M. E. Lombardi is a three-island type hull with a raked clipper stem and a cruiser stern. She has one complete deck, a forecastle, short bridge and short poop. She is propelled by a single screw driven through double reduction gearing by a cross-compound steam turbine deriving steam from two water tube boilers.

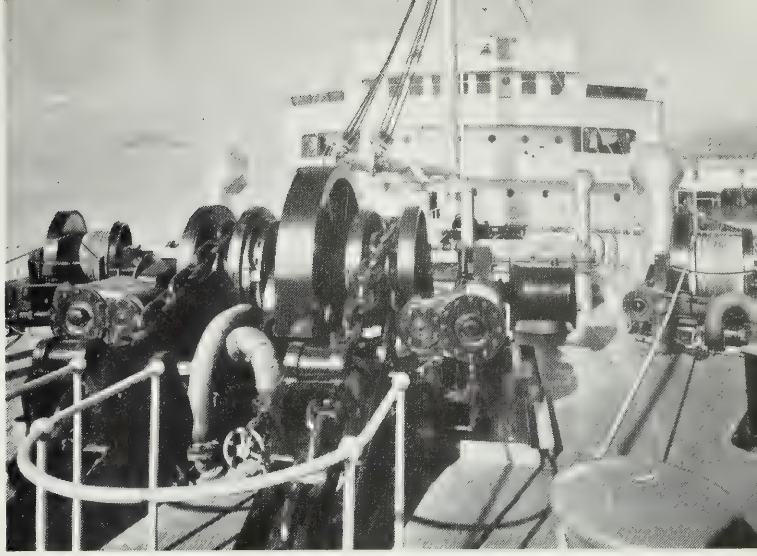
Going aboard this tanker, one is impressed immediately by the smart and effective color scheme on the decks and the deck erections. This is a combination of deck brown, red enamel, aluminum and black carefully worked out not only for smart appearance but to give maximum visibility where most needed, and to afford distinguishing contrasts between functional details. Thus practically all fittings rising from the main deck are in red enamel. If they project vertically above the floor plane of the fore and aft bridge, the part below that plane is in red enamel and the part above is in aluminum. Above the plane of the fore and aft bridge, red enamel appears only in the hand rails of the ladders and in a few hatch coamings and hatch covers.

Black appears on all heated surfaces, such as the main stack, the galley stack and the steam cylinders of the winches, the windlass and the towing engine. All standing wire rope rigging is aluminum, all serving on this rigging is black and all turnbuckles red enamel. The masts are



Navigating bridge has ample room, unobstructed vision and every essential modern navigation and control instrument

Tanker Company of California



Forecastle, looking aft. Steam windlass and mooring winches

aluminum above fore and aft bridge, red enamel below. The large block "S" on each side of stack is aluminum. All cargo oil piping under the fore and aft bridge is red enamel.

In the cargo tank space, there are two continuous longitudinal oil-tight bulkheads, seven transverse oil-tight bulkheads and an oil-tight bulkhead on the center line in way of No. 4 cargo tank. This arrangement provides twenty-four cargo tanks.

All cargo tank hatches are oval in shape and, with the exception of those in No. 4 cargo space, are 72 inches by 48 inches. The No. 4 hatches, including the pump room wing tanks, are 60 inches by 36 inches. All of these hatches have 30-inch coamings, and each is fitted with a cover-lifting gear actuated by a bronze screw. Each cover has a 10-inch ullage plate with a bronze rim, a weighted cover and a bronze flame-arresting screen. Each hatch is fitted with a 4-inch venting line led to a Shand & Jurs pressure-vacuum valve. The outlet from each of these valves is piped up to an 8-inch header that leads to the nearest mast, and the vapor escape is up the mast and released at a high point on the mast through a Shand & Jurs flame-arrester. A railed platform is fitted to each mast to facilitate cleaning and overhauling these arresters.

General Characteristics

Length O. A.	396′9″
Length B. P.	375′0″
Beam molded	57′0″
Depth molded U.D.S.A.	29′0″
Sheer fwd. F.P.	8′9″
Sheer aft A.P.	4′4″
Camber U.D.	14½″
Designed F.L. draft	24′0″
Corresponding deadweight	7300 tons
Summer draft I.L.	24′9⅝″
Corresponding deadweight	7700 tons
Shp normal	3100 tons
Speed	13 knots
Cargo capacity 98% full	58,600 bbls. (42 gal.)
Forward D.T. ballast	365 tons
Fuel oil	2278 bbls.
After bunker fuel oil	3140 bbls.
After peak tank fresh water	86.5 tons
Double bottom aft fresh water	145 tons
Culinary tanks fresh water	74 tons

Drain valves are fitted in the vent headers at their lowest point, and weighted relief valves are fitted in the mast headers.

For shutting off mast vents and for dividing the vent piping system into two sections, Merco-Nordstrom lubricated plug cocks are fitted.

The after end of the cargo tank vent lines header is hooked in with the flue gas system so that inert flue gas can be led through the venting system into any cargo tank to fill the ullage space and thereby

M. E. Lombardi has sweet lines

protect the cargo against fire. This system consists of a 750-cfm blower with suction connection to a flue gas cooler, the incoming side of same being connected to the uptake of each boiler. This cooler is served with cooling water by the fire and sanitary pumps.

There are two steel masts and four steel king posts. The masts and kind posts are each fitted with ladders for full height. Two of the king posts are installed one on each side of pump room amidships. Each of these posts is fitted with a steel boom of four tons capacity for handling oil hose.

The other two posts are installed one on each side of casing aft of stack. Each of these posts is fitted with a four-ton steel boom for handling machinery parts and stores, and with step sockets for this boom on forward and aft sides of post. Two 5-ton steel booms are fitted to the goose neck of the foremast, and step sockets for these booms are fitted one on the after side of foremast and one on each side of mainmast.

Location of fair leaders, chocks and cargo winches serving these booms is shown on the general arrangement herewith.

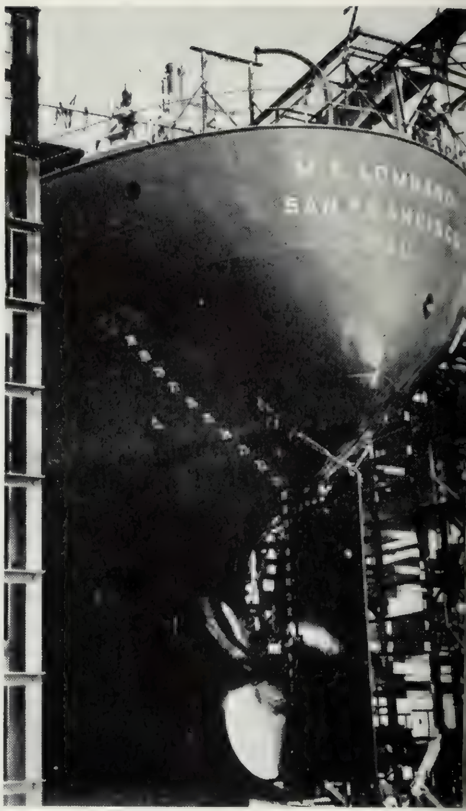
Amidships, the cargo pump room is in the No. 4 tank space, and just aft of the pump room hatch on the upper deck are four 8-inch discharge pipes running thwartship, with discharge openings port and starboard, and one 8-inch discharge line running aft for discharge over the stern.

These discharge pipes are all arranged with filling by-pass connections.

Where required, the pipe lines are fitted with Shand & Jurs standard line blinds for segregating the pumps and preventing contamination between mixed cargoes. All valves are of the non-rising stem wedge type with Tobin bronze stems and with hand holes completely bronze fitted. All gaskets are Hydroil, by the Anchor Packing Company.

Four main cargo pumps are installed. These are of the horizontal duplex direct-acting reciprocating steam type 16″ x 14″ x 18″, and each has a capacity of 880 gpm at 60 fpm piston speed. In addition, there are two auxiliary cargo pumps of the same type 10″ x 7″ x 10″, each having a capacity of 200 gpm at 68 fpm piston speed. These capacities are maintained against a discharge pressure of 115 psi on a steam pressure of 175 psi (either saturated or 50° superheat) when exhausting against 10 psi gage back pressure. The steam end of these pumps has high grade cast iron cylinders and pistons with steel piston rod. The pump cylinders are cast iron with bronze liners, bronze pistons and bronze piston rods, and are fitted with all bronze valve service. All cargo pumps were built by the National Transit Pump and Machinery Company.

The combined capacity of this pumping plant is 5600 barrels an hour, so that if this tanker were loaded with all tanks full of one grade of fuel oil, the pumps could empty her in about ten hours. This condition will probably never exist. We cite it merely to show that there is ample pump capacity to take care of the specialized deliveries at various ports without delay in ship's schedule.



View showing stern, rudder and propell
just before launching

Mrs. M. E. Lombardi makes an impression. When she christens them they stay christened

All deck machinery is steam driven, built by American Engineering Company, and includes:

One double-reduction spur-geared horizontal steam windlass capable of hoisting simultaneously both anchors from 30-fathom depth at a chain speed of 30 fpm. Wildcats and locking heads are of cast steel. Two whelpless gypsey heads 24 inches in diameter and 27 inches long are mounted on extensions of the intermediate shafts.

Six mooring winches each with a 10″ x 10″ engine geared to produce a pull of 13,100 lbs. on 100 psi steam and a maximum pull of 20,000 lbs. These winches: will accommodate on the drum 1300 feet of 1¼-inch cable; have a winding speed of 130 feet a minute; and are equipped with an automatic tension device. They are located: one on poop deck aft; two on top of the poop deck house, one port and one starboard at quarters; two on forecastle deck, one port and one starboard; and one on upper deck forward. The winches on poop deck and on upper deck forward are fitted with gypsey heads.

One heavy duty mooring winch for warping use, located on upper deck amidships, with extension shaft to gypsey

At the after-launching luncheon, J. H. McEachern, manager Marine Department, Standard Oil Company of California, says a few well-chosen words

heads port and starboard; two cargo winches; and a winch for stores.

Crew's Quarters

In the bridge erection, one notes a change from the usual arrangement in that on the bridge deck level this erection houses: five rooms accommodating a total of ten seamen; a room for the bo's'n; a room for the pumpman; the seamen's washroom; the four-berth hospital and its bathroom; and the owner's room and bath. Each seaman's stateroom is provided with: one combination desk; two armchairs; one standard pipe standee with two berths, each 32 inches by 78 inches clear inside, and fitted with standard mattresses; one china wash basin with running fresh hot and cold water; one toilet cabinet of the medicine locker type with mirror door and with a rack for a water container and two glasses; two clothes lockers of the built-in type, of large size and fitted with hat shelf, coat hooks and rail for clothes hangers; a soap holder and a towel rack; a book rack and a radio shelf; carpet runners in front of the standee berths; drapes on the air ports; a bulkhead receptacle for radio attachment; a ceiling light with switch at the door; a pullman type reading light for each berth; a steam radiator for heating; and ample mechanical ventilation.

Here it is interesting to note that the provision of sanitary equipment in these quarters is far more adequate than was considered necessary for first class passengers twenty years back. For instance, these ten seamen and two petty officers on the bridge deck of this tanker have nine wash basins, two baths and two toilets for their exclusive use, all of which are equipped with the highest grade of plumbing fittings, and are vented and drained in the most approved manner.

The normal crew on this vessel would be 37 persons, for whom there are installed 38 wash basins, 16 baths and 15 toilets. We cite these figures merely to show that ship management these days is providing in very lavish fashion for the comfort and health of ships' personnel, and that Standard Oil Company of California is a leader in this phase of intelligent ship operation management.

This accommodation for seamen in the bridge erection is made possible by moving the captain's suite from the upper bridge deck to the navigating bridge deck just aft of the chart room, and so finding room on the upper bridge level for: the staterooms and baths for first, second and third mates and pilot; the ship's office; and the radio room and radio operator's stateroom.

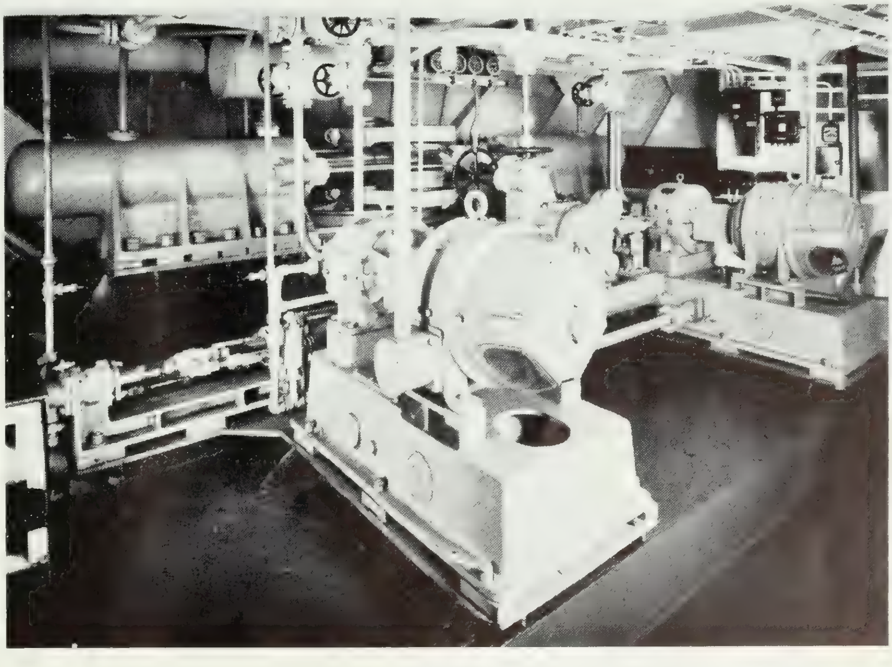
The color scheme of these rooms is very attractive. Bulkheads and lockers are a pale green with black lacquer border, ceiling is in cream, berths and radiators are aluminum, decks are in tan lacquer and doors in brown lacquer.

This color scheme with slight variations is carried throughout the crew's and officers' quarters. Thus all alleyways, companionways and spaces like chart, gyro compass, wheel house and steering engine rooms have buff bulkheads and cream ceilings. The alleyways have red lacquer decks and companionway ladder rails and sides are red enamel. The galley has cream walls and cream ceiling.

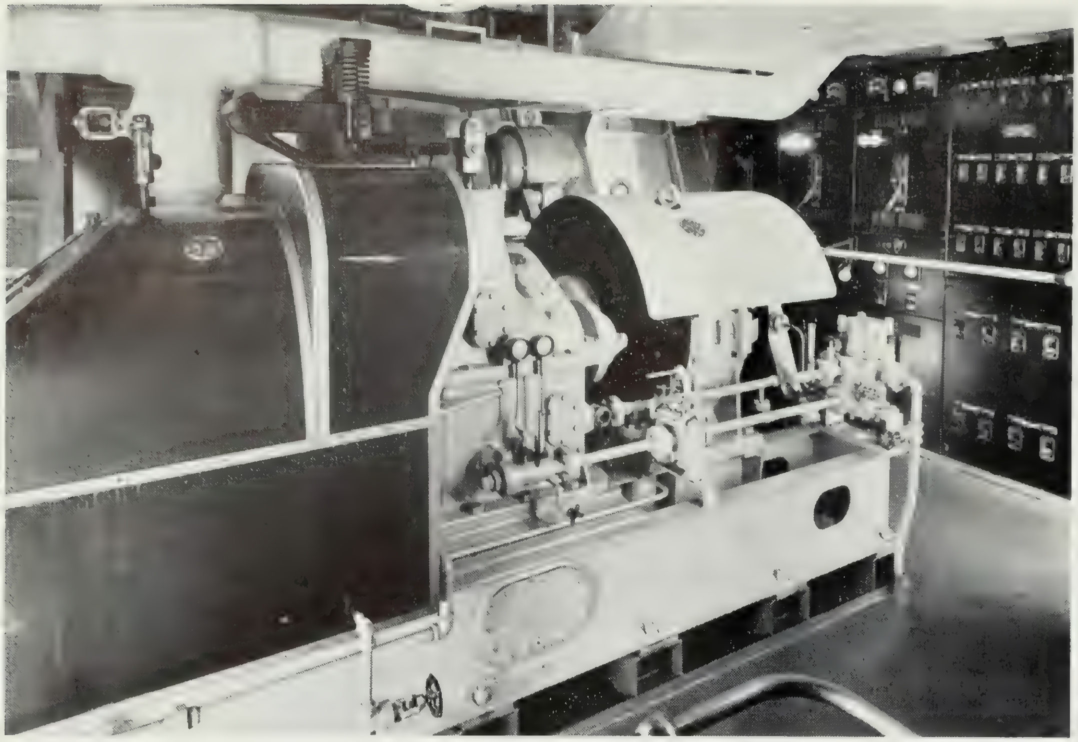
Moving the ten seamen to the bridge deck provides ample room to properly house: the steward, cook, messboys, galley, officers' mess, crew's mess and crew's lounge on the poop deck; all the engineer officers on top of poop deck house; and all firemen and oilers and wipers, laundry, refrigeration machinery, refrigerated space for galley stores, butcher shop and engineers' laboratory on the upper deck level under the poop.

Propulsion Machinery

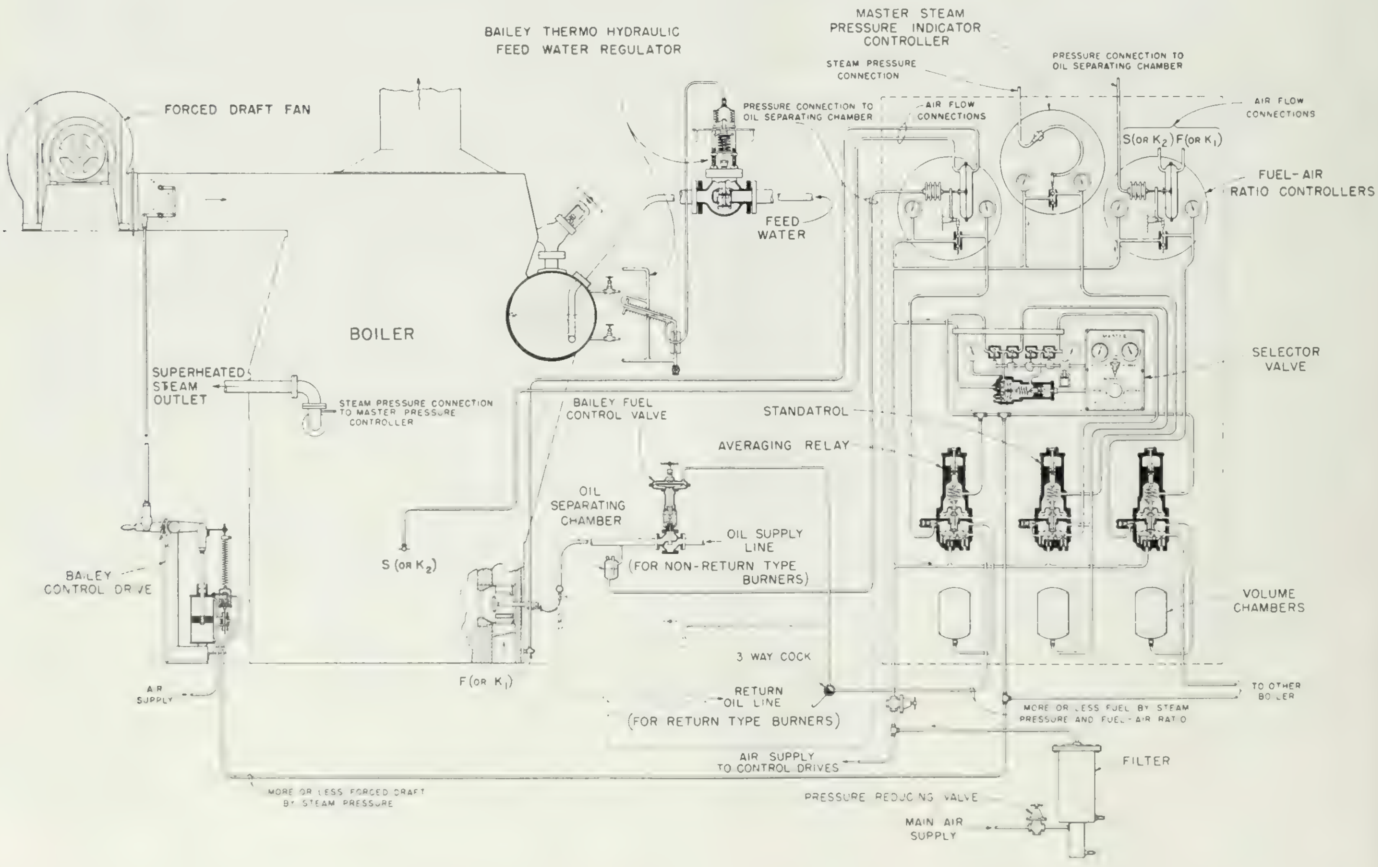
Steam is generated in two Babcock & Wilcox water tube boilers designed for a working pressure of 400 psi gage and a



The steering gear is of the electro-hydraulic American Engineering Co. type



One of the two G. E. 200-kw geared turbo-generating sets for supplying electric energy for auxiliary power, lighting and cooking

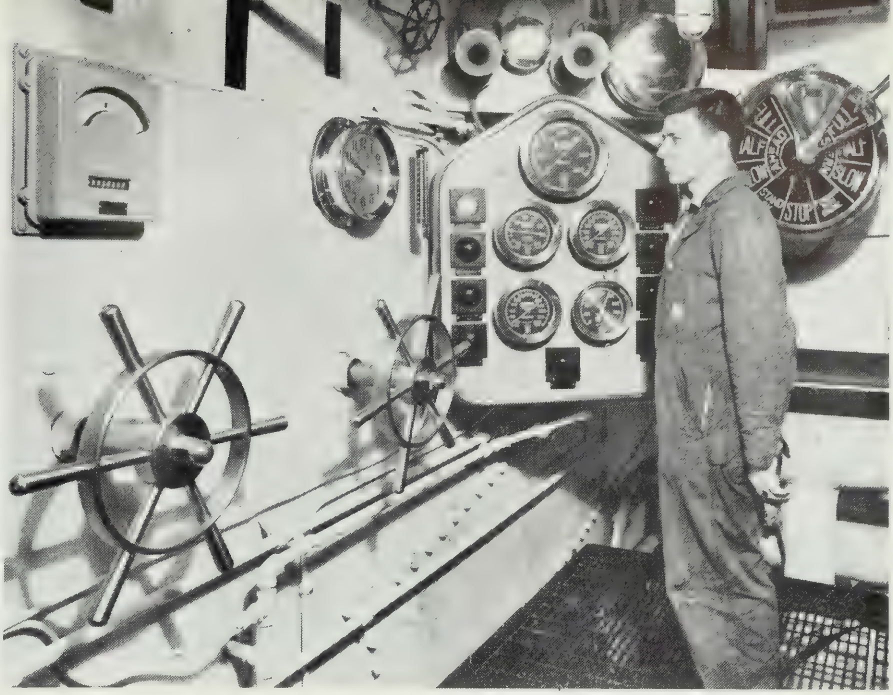


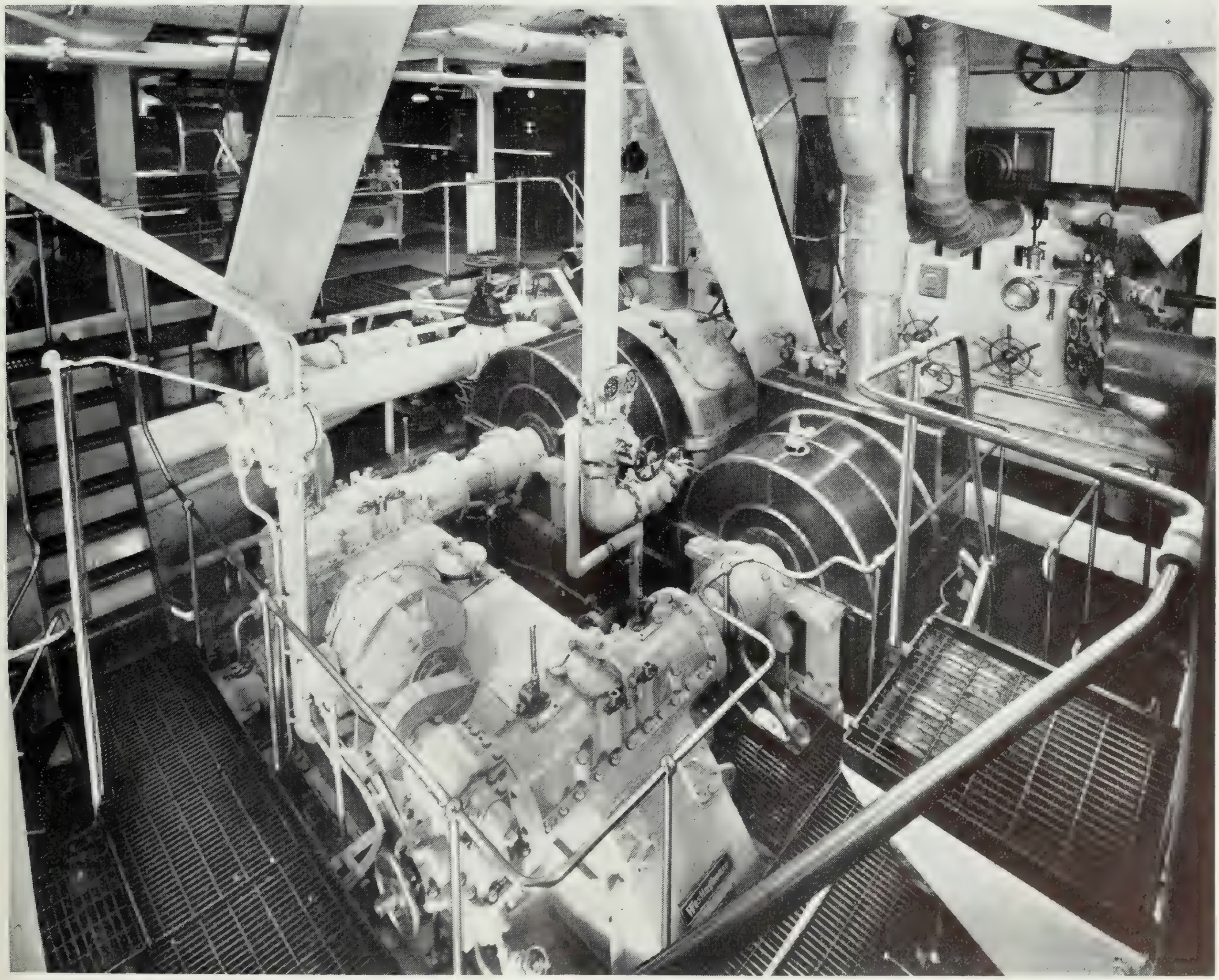
Diagrammatic arrangement of the Bailey combustion and feed water control

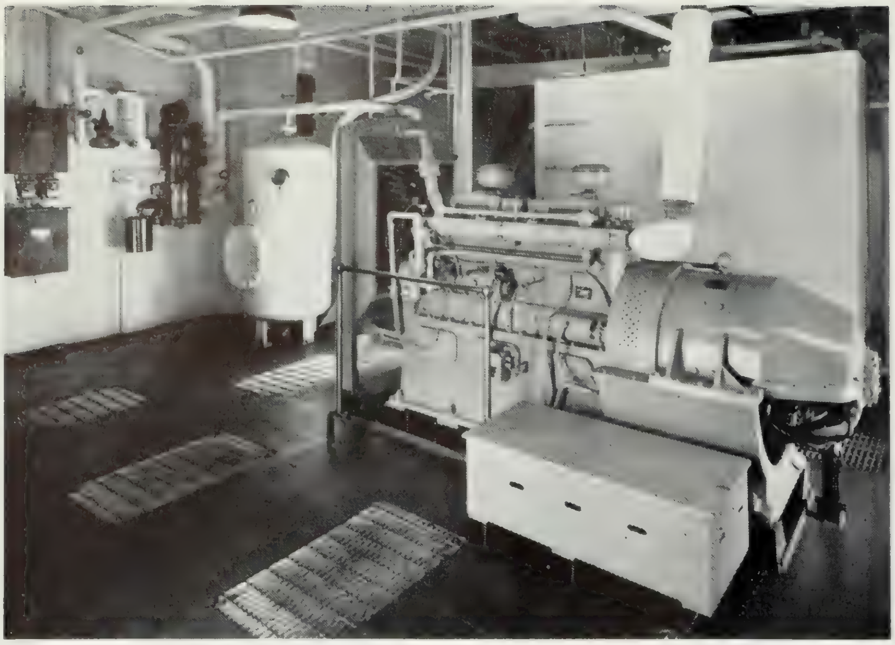
MASTER STEAM PRESSURE INDICATOR CONTROLLER
BAILEY THERMO HYDRAULIC FEED WATER REGULATOR
STEAM PRESSURE CONNECTION
PRESSURE CONNECTION TO OIL SEPARATING CHAMBER
FORCED DRAFT FAN
PRESSURE CONNECTION TO OIL SEPARATING CHAMBER
AIR FLOW CONNECTIONS
AIR FLOW CONNECTIONS
S(OR K_2) F(OR K_1)
FUEL-AIR RATIO CONTROLLERS
FEED WATER
BOILER
SELECTOR VALVE
SUPERHEATED STEAM OUTLET
STEAM PRESSURE CONNECTION TO MASTER PRESSURE CONTROLLER
BAILEY FUEL CONTROL VALVE
STANDATROL
AVERAGING RELAY
OIL SEPARATING CHAMBER
OIL SUPPLY LINE
(FOR NON-RETURN TYPE BURNERS)
S (OR K_2)
BAILEY CONTROL DRIVE
VOLUME CHAMBERS
3 WAY COCK
F(OR K_1)
AIR SUPPLY
RETURN OIL LINE
(FOR RETURN TYPE BURNERS)
TO OTHER BOILER
MORE OR LESS FUEL BY STEAM PRESSURE AND FUEL-AIR RATIO
AIR SUPPLY TO CONTROL DRIVES
FILTER
MORE OR LESS FORCED DRAFT BY STEAM PRESSURE
PRESSURE REDUCING VALVE
MAIN AIR SUPPLY

Below is shown the engine room of the M. E. Lombardi with its Westinghouse cross-compound, double reduction geared turbine, which is rated 3100 shp at 93 rpm of the propeller shaft, and drives the hull at 13 knots

At right, a close-up of the operating control stand







An auxiliary diesel-driven generator is provided for electric service in port or when laid up

total temperature of 750° F. at the superheater outlet at full load. Each of these boilers: has a water-heating surface of 3596 square feet; evaporates 17,000 pounds per hour; and is fitted with Decagon oil burners. Combustion air is supplied to these burners by motor-driven forced draft fans, which discharge through the combustion air heaters into the double casings of the boilers and so to the burners. Bailey automatic combustion and draft control is fitted. Fuel oil is served to the burners by two De Laval (IMO) motor-driven pumps each with a capacity of 10 gpm at 300 psi pressure.

Combustion Control

The master steam pressure indicator-controller establishes an air loading pressure which automatically positions the Bailey control drive on the forced draft damper and the Bailey control valve in the fuel-oil supply line, in accordance with the load requirements as indicated by slight variations in steam pressure. This loading pressure automatically divides the load equally between the boilers much as hydraulic brakes on an automobile divide the braking effect equally between the wheels.

In order to maintain best combustion conditions at all times, it is necessary to readjust the fuel feed from the fuel-air ratio controller. This readjustment is accomplished by applying the loading pressure both from the master controller and from the ratio controllers of the Bailey averaging relay, as indicated on the drawing. These averaging relays in turn establish a loading pressure representing both the load requirements and the combustion efficiency requirements.

A Bailey master selector valve affords the operators the opportunity of placing boilers on hand control instead of automatic control should it be considered advisable to do so. In addition to providing a means for switching from hand to automatic control, this selector valve is provided with an adjustment knob by which the rate of steaming of both boilers may be either increased or decreased at will from the boiler control panel.

A Bailey thermo-hydraulic feed water regulator is installed on the feed water line to each boiler. These feed water regulators control the flow of feed water to the boilers in accordance with the rate of steam output as reflected by slight variations in boiler water level. The regulators are self-contained, and employ their own thermo-hydraulic system for the automatic regulation of the feed water valve.

From the superheater outlets steam is carried to a short header which connects through throttle valve to the nozzles of the high-pressure turbine and delivers steam to those nozzles at 375 psi and 740° F. This turbine is of the latest Westinghouse combined impulse and reaction type cross-compound design with one high-pressure and one low-pressure unit.

Under normal full load operating conditions with steam as above indicated and exhausting into a vacuum of 28¼ inches of mercury, the high-pressure rotor will turn 6000 rpm, and the low-pressure rotor 5000 rpm, and at these speeds each turbine will deliver approximately 1550 shp to its respective pinion in the Westinghouse double-reduction gear set which connects them to the propeller shaft. This shaft under normal full load conditions revolves 93 rpm.

An astern element is fitted in the low-pressure turbine casing and is designed to produce 85 per cent of normal ahead torque at 50 per cent of the normal full speed ahead revolutions.

The reduction gears are of the double helical type. All pinions are of forged nickel steel, and all gears have cast iron centers with steel rims keyed and shrunk on. The casings are of the latest fabricated steel plate and steel castings type. A Kingsbury thrust bearing is fitted in the forward end of the low-speed gear housing.

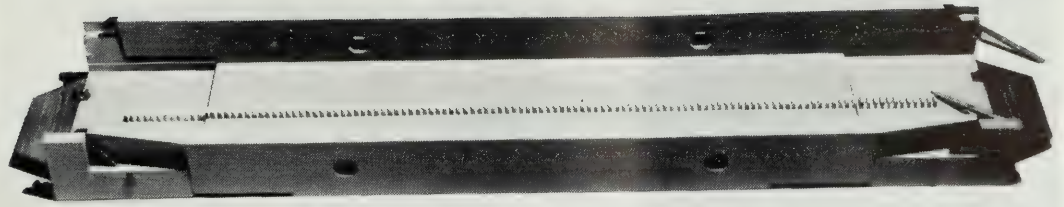
A solid four-bladed manganese bronze propeller of 16′9″ diameter and 15.07′ pitch drives the ship.

The low-pressure turbine exhausts directly into the main condenser, which is arranged athwartships just under the turbine unit. This condenser is a Westinghouse two-pass radial-flow type of 4135 square feet cooling surface, and maintains a vacuum of 28¼ inches of mercury when supplied with cooling sea water at 85° F.

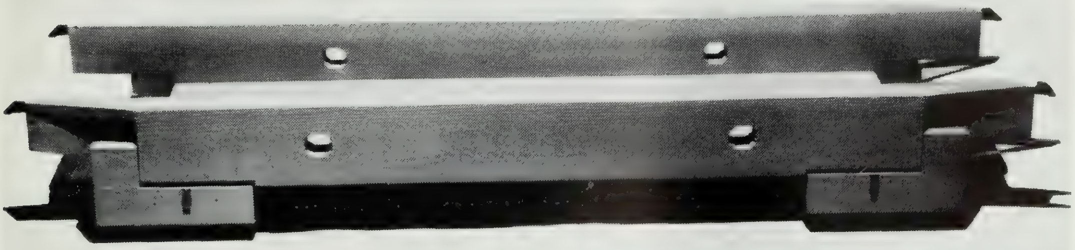
This unit is served by: a Westinghouse air ejector with inter and after condensers; a De Laval motor-driven vertical centrifugal main condenser circulating pump with a capacity to deliver 6000 gpm on a discharge head of 25 feet, and by two main condensate De Laval motor-driven vertical centrifugal pumps each of a capacity of 100 gpm at 125 tdh.

The condensate pumps discharge through the air ejector condensers to the Cochrane deaerating feed heater, which acts as a hot well to and provides positive suction head for the two main feed pumps. These pumps are De Laval horizontal multistage steam-turbine-drive centrifugals each with a capacity to deliver 115 gpm against 500 lbs. head. They deliver feed water to the boilers through a vertical multicoil type heater fitted with a by-pass. Operating in series, these two heaters raise the feed water from 90° F. to 300° F. when supplied with exhaust steam at 10 psi gage to the deaerating heater, and bled steam at 70 psi gage to the second stage heater.

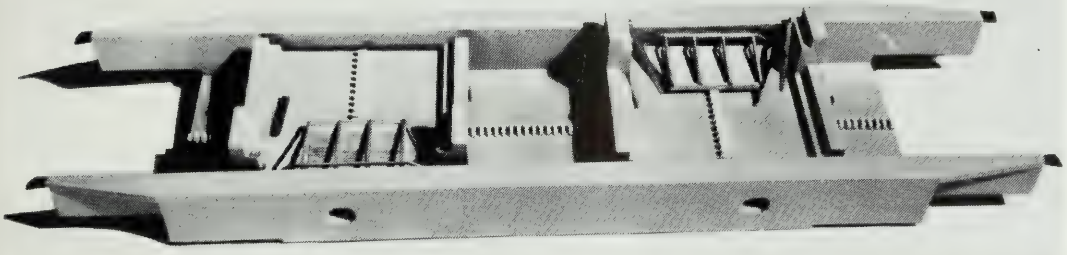
M. E. Lombardi is a welcome addition to the fleet of the Standard Oil Company of California, and will perform a very useful service in the distribution of petroleum products to the ports of the Pacific Coast.



Model of dock fully extended



Center self-docked on two ends



Two ends self-docked on center

A New Naval Floating Drydock

Economy, strength, stability and greater lifting power in proportion to its own structural weight as compared with previous types of floating drydocks are the main characteristics of the United States Navy's new sectional self-docking type floating drydock, the signing of contracts for the construction of which was announced by John D. Reilly, president of Todd Shipyards Corporation, 1 Broadway, New York, on Saturday, January 11.

Of all-welded construction, the hull for this dock will follow the present-day method of prefabrication. It will be put together in several sections, and when completed will be operated for the U. S. Navy at Todd Galveston Dry Docks, Inc., Galveston, Texas, subsidiary of Todd Shipyards Corporation. Present plans call for completion of the dock in eight or nine months, a saving of approximately 25 per cent over what might be termed normal construction time.

Outstanding of the several new and patented features of the drydock are its buoyancy chamber and circular bottom, the combination of which leads to economy and strength.

The buoyancy chamber is built in and runs longitudinally through the bottom of the drydock, and, in addition to providing the buoyancy necessary to overcome the weight of the dock when the deck is awash, acts as a structural "vertebra"—giving additional strength.

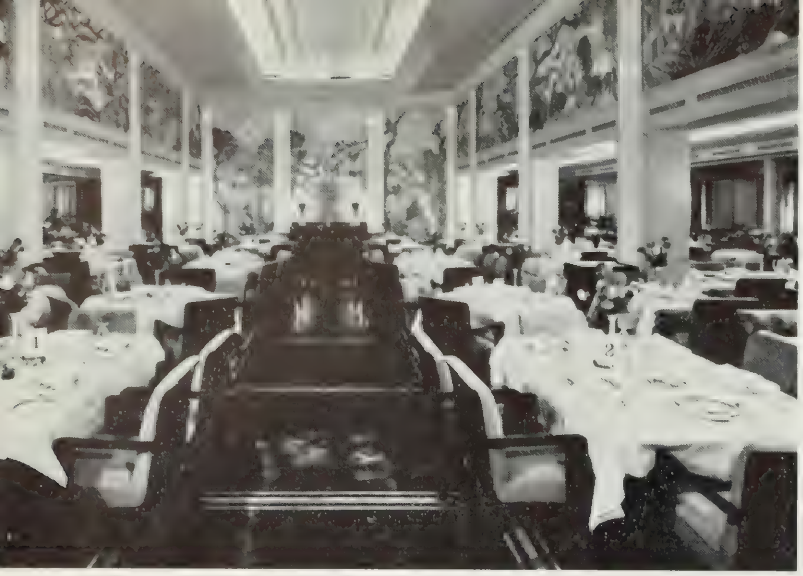
The effect of the circular bottom is that when a vessel is on the dock and the water has been pumped out of the dock, more buoyancy is created and the pick-up of the load is concentrated in the center of the drydock. In the older types of floating drydock, this load-weight was spread transversely uniformly over the dock.

The weight of the new dock is approximately 4,800 tons, including all operating machinery, while its lifting power is 18,000 plus tons. The figures are approximate. Thus it is seen that the structural weight is about 25 per cent of its lifting power.

In older type floating drydocks, the structural weight has approximated 35 per cent of the lifting power. Thus there is a 10 per cent advantage in the new type, which was designed by Frederic R. Harris, Inc., consulting engineers of Todd Shipyards Corporation. In practice it is believed that this new type drydock will be able to lift 30 per cent more than older types of the same weight. General dimensions are:

Length overall	614′
Length between outriggers	544′
Length of center section	384′
Width overall	116′
Width between wings	90′
Height of wings to crown line	42′3″
Height—wingtop to bottom of dock	48′9″

There are three sections to the dock—the center section and two ends—and, without even moving the dock from its moorings, it is possible to dock either the center section on the two end sections, or the two end sections in the center section for overhaul or cleaning, this being a feature that not even the most modern present-day floating drydocks possess.



The main dining saloon is neutral in coloring. Interest is obtained by the use of contrasting values, from the light tones of the bulkheads to the very dark rubber deck covering. The design of the carved linoleum murals by Pierre Bourdelle, depicting sections of the United States, is brought out by the use of gold, silver and copper leaf

Decorating U. S. Liner

by

Dorothy Marckwald

I have been asked to write an article for my firm on the interior decorations of the S. S. America. Working together, Miss Urquhart and I spent more than a year and a half on this job.

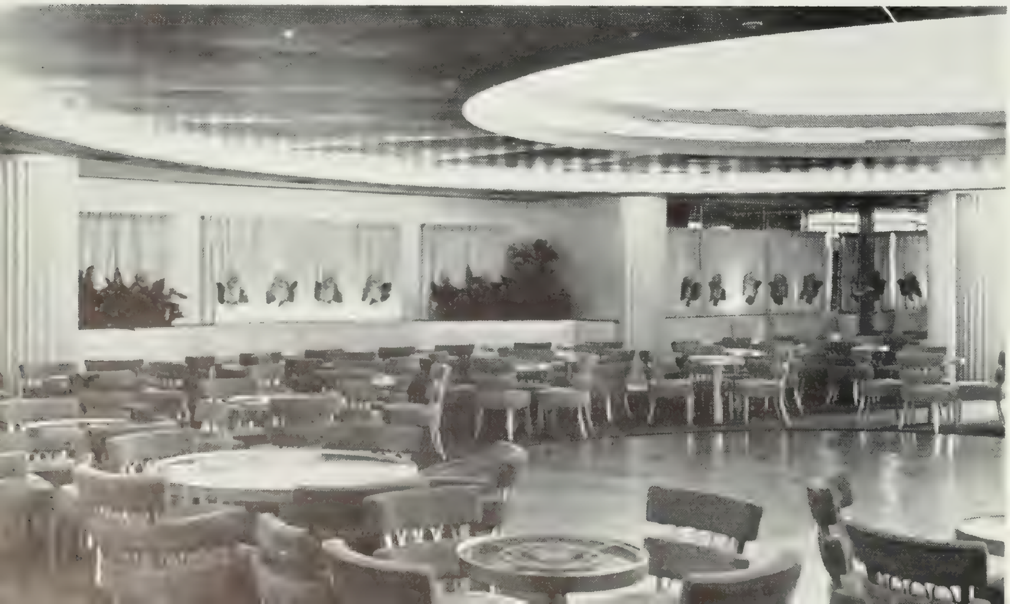
We four women partners of the firm of Smyth, Urquhart & Marckwald, Inc. have been in the decorating business together for eighteen years. During that time we have decorated clubs, hotels, ranches, yachts, banks, executive offices, and more town and country houses and apartment residences than we could possibly remember.

Several years ago, we were asked to decorate the four new Grace Line ships, Santa Rosa, Santa Paula, Santa Lucia and Santa Elena. This was the first time any of us had tackled a major passenger ship, and there was much to learn. Although the idea of women decorating ships was then quite unheard of, it is not without reason. For the majority of the pasengers are women, and no man could ever know as much about their comfort problems and taste reactions as another woman.

When the Santa ships were planned, the word "modern" gave most Americans a dubious feeling. Therefore, Eighteenth Century interiors were chosen and designed for these ships by the architects. This, combined with appropriate decorations and furnishings, presented the appearance of a quiet English country house. An attractive job was done within these conventional limitations, and these ships still represent the finest in our intercoastal service.

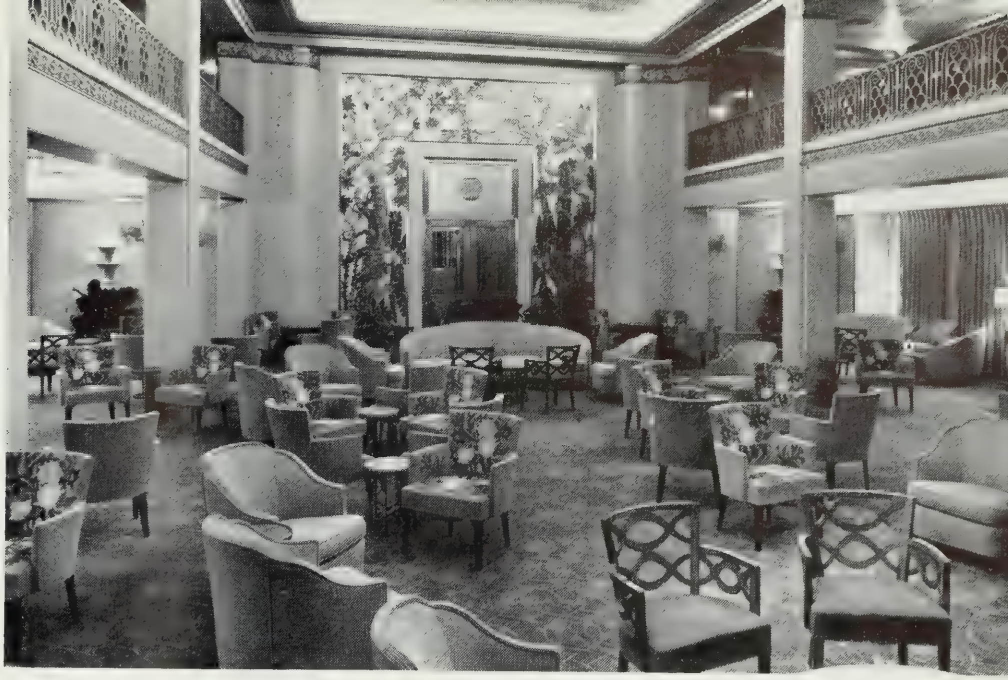
The United States Maritime Commission awarded us the contract to plan and supervise the interior decorating and furnishing of the United States Lines' S. S. America. A supervisory committee was set up to coordinate the work. This included representatives from the Commission, the United States Lines, Gibbs & Cox, Newport News Shipbuilding & Dry dock Company, Eggers & Higgins, and ourselves.

The experience gained on the Grace Line ships was a great asset when we started work on the America. But the America, intended for transatlantic service, presented a problem quite different from the intercoastal service of the Santa ships. She was built to compete with the latest European vessels. The decoration in the newer foreign ships had broken with the Eighteenth Century tradition and the style had shifted to one in which the characteristics of each individual nation were reflected in the decoration of its ships. This was particularly notable among the Italians, French, British and the Dutch. Was America to cling to the designs of the old foreign cabinet makers, or follow the new foreign ship stylists, or strike out for herself? It was appropriately decided that this latest of our passenger ships should



Mirror and glazed aluminum leaf form the background of the ballroom. Soft red chairs and carpet, combined with the sparkle of the anodized aluminum furniture, create a festive feeling. Curtains are of silvery gray with brightly-colored American beauty roses of looped chenille designed by Dorothy W. Liebes

America



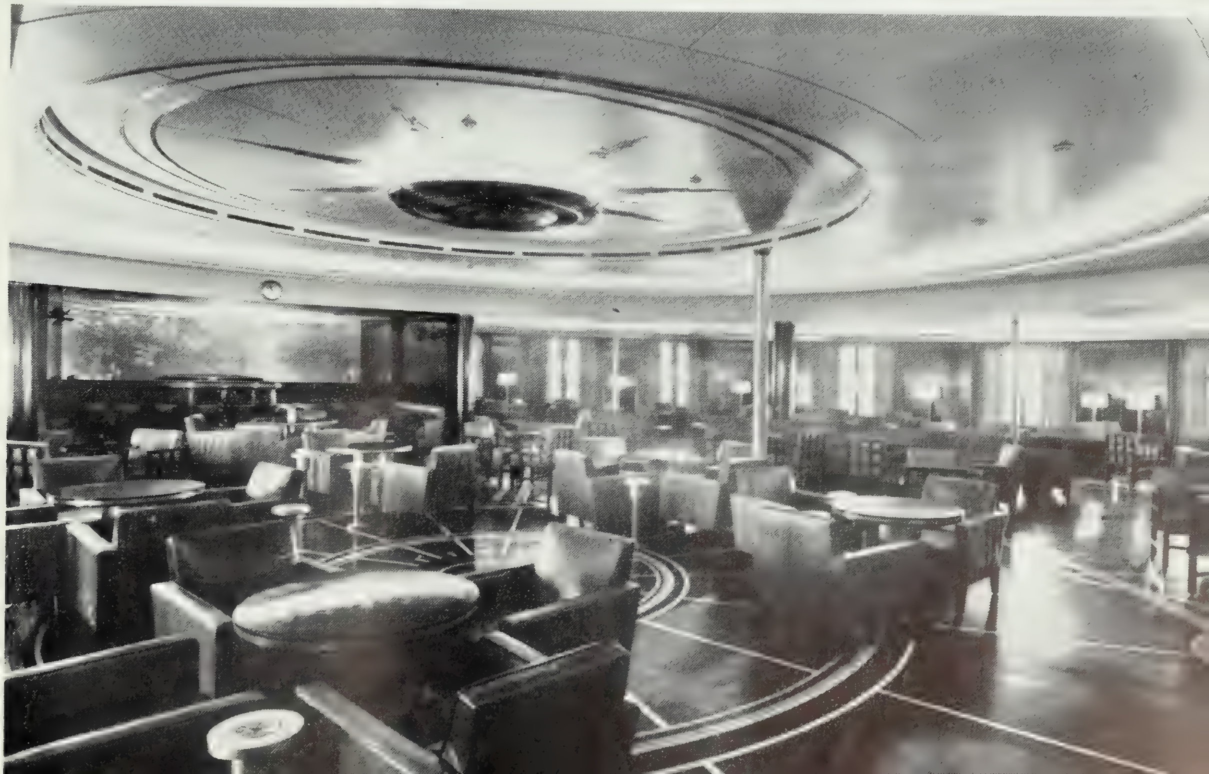
↑ *Beige is the color in the main lounge. A gesso mural by Charles Baskerville, and the needlework of the chairs designed by Smythe, Urquhart & Marckwald, are brightly colored. The tone of the bronze architectural details is repeated on the ceiling and background of the mural. Puerto Rican craftsmen wove and carved the carpet*

distinctly and completely represent our own national personality. As she would embody the last word in the development of marine architecture, efficient engineering, and fireproof safety at sea, her decorations should be American down to the last detail. Therefore a simple, functional, comfortable American style was decided upon. The interior architects designed the backgrounds and we proceeded along these lines.

As usual, a full-size model stateroom was constructed at the shipyard. This was completely decorated and furnished, criticized, revised, and finally approved. We then worked out a general color scheme for the entire ship, the 23 public spaces, 395 staterooms and 8 luxury suites. For

●

↓ *The bulkheads in the smoking room are ebonized wood veneer. Red and soft blue predominate in the curtains and upholstered furniture. A carved glass mural designed by Austin Purves, Jr., forms the background of the bar, and map murals by Barry Faulkner decorate the after end of this space*



many reasons, colors are limited for schemes on ships, but they play a most important part in any interior. They must be used in various ways and combinations to avoid monotony and give the feeling of cleanliness and cheerfulness. Shades of clear blues, greens, and reds were used, together with the neutral tones throughout.

Because wood veneer is most practical for upkeep, it was used extensively on the marinite paneling for the bulkheads. For variation, the woods were selected not only for their colors but also for their grain patterns. These range from the plain rift oak to the intricate lacewood. The dark brown woods used so much in the ships of yesterday were avoided because of their stuffiness. In place of these, many light colors were chosen, especially in the staterooms, where they helped to create a feeling of spaciousness.

Color and form schemes were first worked out for approval in general. Then exact layout plans, small-scale models in color, furniture designs, materials, floorcoverings, lamps and all details for each space, in turn were presented to the committee for consideration and approval. To achieve our goal of everything American in design and feeling we sent research workers into libraries and museums, searching for American ideas. They delved into early American documents; considered Indian lore and the history of the United States. They returned with designs and ideas that were adapted to contemporary usage and worked into patterns for this newest ship. Every piece of furniture was designed by us for its particular location, always with the consideration of comfort and suitability for the purpose of that space.

Materials played an important part in our schemes. Many of them were designed in our own shop, some by specialists with whom we had discussed our ideas. Our central though was to concentrate on modern materials that looked plain, materials with interesting weaves and textures that were solid, unobstrusive, restful, practical. Fabrics with patterns that reach out and demand to be seen were used sparingly.

Contemporary design lends itself perfectly to stateroom planning. Very simple furniture with drawers to the floor was designed to fit every available space and to provide ample storage for the passengers' use. The appearance of overcrowding was avoided by matching the wood of the furniture to the veneer on the bulkheads in every case. Embroidered or printed materials, both washable and sunfast, were individually designed and woven to order for the curtains and bedspreads. The design for the rubber decking was considered important. The long narrow feeling of the passageways was lessened a bit by a design of squares running across rather than lengthwise. The decorative treatment in the spacious foyers, also, depended to a large extent on the floor design. An old braided rope display in the Mariners Museum at Newport News inspired the pattern for the floor of the most important foyer.

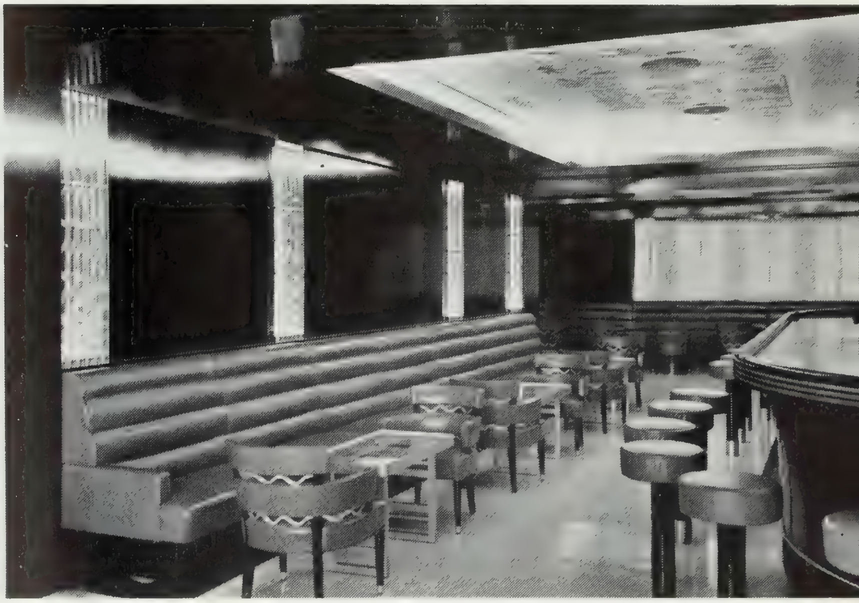
Again to obtain variety of treatment, many prominent American artists specializing in various mediums were chosen by the committee to execute mural decorations. Some of the mediums used included carved glass, etched metal, carved lino-

(Page 45, please)

Swimming pool, in deep blue and silver tile with doors and railing in satin finish Monel. Decoration at the far end is by Andre Duranceu

n aluminum leaf panels in the sitting room of this two-room suite e accurate paintings of American ducks in their natural colors. Coloring is white and silvery gray with small accents of brilliant green

↑ This illustration shows the ample size of the typical cabin class staterooms as planned by the naval architects. Cheerful colorings were used, and additional conveniences planned by the decorators provide maximum comfort



le the tourist class staterooms are less luxurious than those in cabin class, they have been made unusually attractive and would pass for first class on many of today's liners

↑ The cocktail bar bulkheads are polished ebonized wood veneer with groups of carved lighted lucite rods. Gayly colored and amusing murals by Constantin Alajalov decorate the ceiling. All furniture is covered in clear bright green leather

↓ One of the smaller suite sitting rooms. Flower murals are painted in shades of beige and white on a soft blue background. Deep red leather lamps and chair seats add color contrast

↓ The third class staterooms are practical and cheerful, equal to first class of fifteen years back

The C-1-B Cargo

Fourth of Five Sister Ships Built by Federal and Engined by De Laval for Lykes Brothers Steamship Company

Fourth of a series of five identical steamers built by the Federal Shipbuilding and Dry Dock Company, Kearny, New Jersey, for Lykes Brothers Steamship Company of New Orleans, Louisiana, the Fred Morris was delivered on December 27, 1940, after successful trials under the representatives of the owners and the trial board of the U. S. Maritime Commission.

These vessels are of the full scantling type, built to the Commission's C-1-B design with certain modifications to adapt them for the owners' Gulf Ports to U. K. and Mediterranean ports service.

The design calls for a transverse frame hull with raked stem cruiser stern and two complete steel decks, designated main and second decks, respectively. A steel deck below the second deck is fitted in all cargo holds forward of the machinery space, and a steel flat is carried across the holds aft at the level of the top of shaft alley.

Seven transverse bulkheads are carried water-tight up to the main deck.

Since the vessel will usually be in light condition on her westerly voyages, deep tanks are provided for liquid cargoes or for balasting the ship. Several of these tanks are equipped for carrying oil cargoes, and several for carrying fuel oil.

Arrangements are installed to trim the ship, and navigating apparatus installed on an upper bridge to give maximum visibility for river and canal navigation. To meet Manchester ship canal headroom limitations, the masts are made telescopic.

The principal characteristics are:

Length overall	417′ 9″
Length B. P.	395′ 0″
Beam molded	60′ 0″
Depth molded	37′ 6″
Draft molded, load	27′ 6″
Gross measurement	6863 tons
Net measurement	4007 tons
Built weight	3780 tons
Fuel oil	1301 tons
Passengers', crew stores	30 tons
Fresh water	415 tons
Cargo	7349 tons
Total deadweight	9095 tons
Displacement	12,875 tons

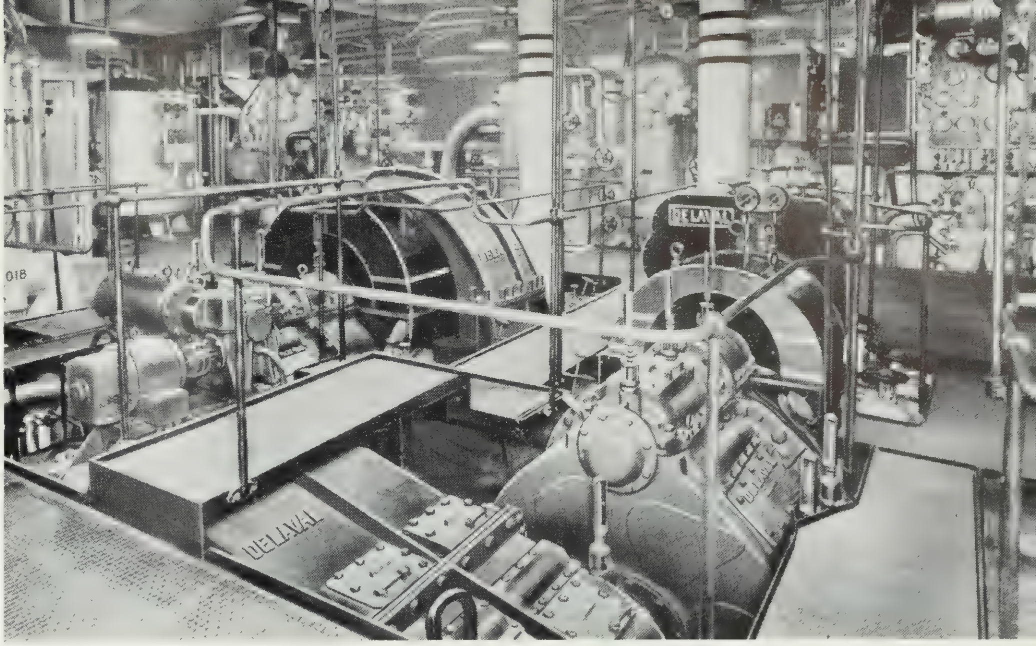
Propulsion Machinery

The main propulsion unit comprises a cross-compound impulse type double-reduction-geared De Laval steam turbine. The turbine is arranged with two casings, and the reduction gearing is of the De Laval single-casing double-helical type. Overall dimensions and arrangement of the turbine units in relation to the gear case are shown in the drawing reproduced herewith.

Each high-speed gear is driven by a high-speed pinion connected to the respective turbine shaft, and the high-speed gears drive the low-speed pinions through quill shafts with flexible couplings located at the after ends of the low-speed pinions. The gears are mounted in single, welded steel gear casings.

At the normal propeller speed of 90 rpm, the high-pressure turbine revolves at 5938 rpm, and the low-pressure turbine at 4518 rpm, the unit developing 4000 shp when supplied with steam at 440-lb. gage and 740° F. total temperature. With a sea speed of 14 knots, and with some fouling of bottom and adverse weather conditions, it is estimated that 3750 shp will be required, the excess being for emergency conditions.

The fuel consumption when generating 3750 shp is to be about 166 bbls. per day of 15 API oil, giving a cruising radius of around 10,000 nautical miles from the 879 tons of oil which can be carried in the double bottom tanks Nos. 2, 3, 5 and 6.



Engine room of the Fred Morris, showing cross-compound double-reduction-gear turbine

Steamer Fred Morris

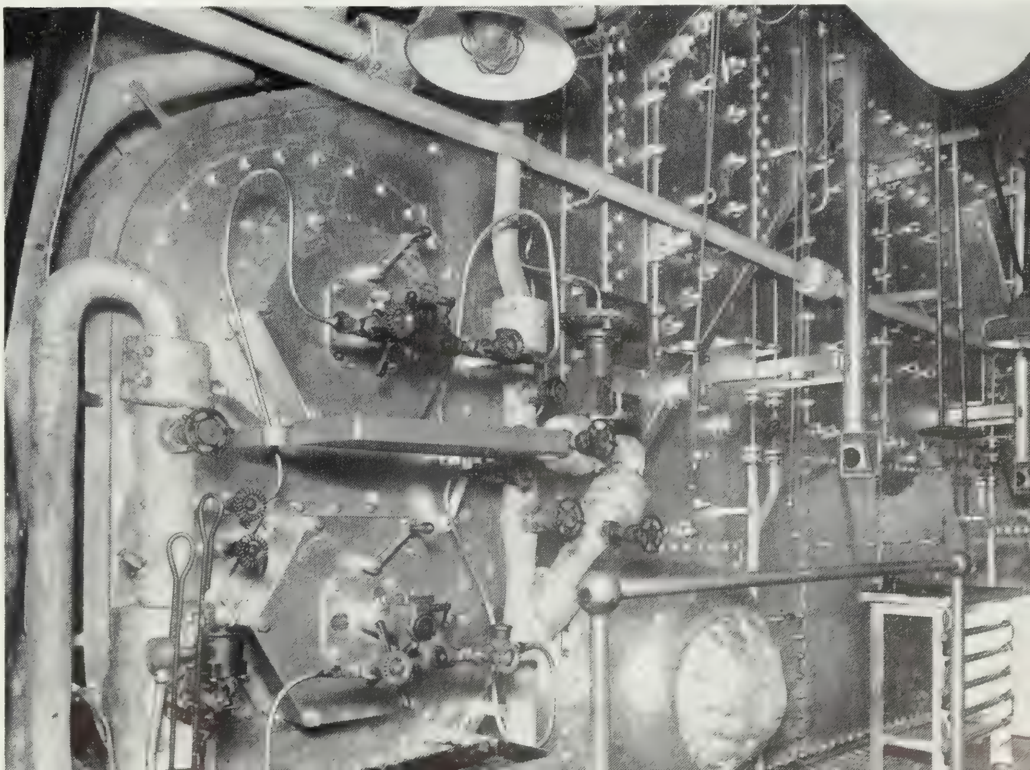
If all double bottom and deep tanks, except No. 4 double bottom tank, were piped for fuel oil, the cruising radius would be increased to approximately 15,700 nautical miles.

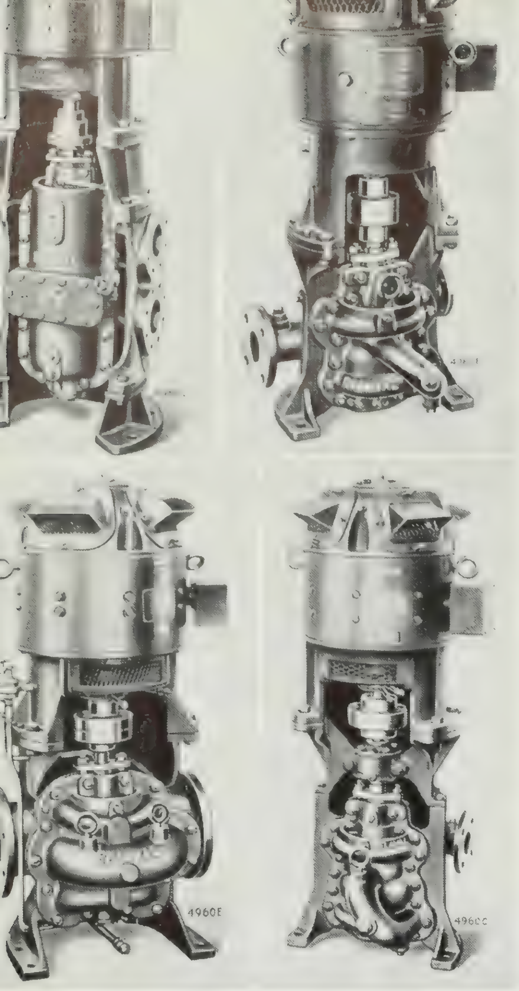
An astern turbine capable of developing 40 per cent of the forward power is mounted in the low-pressure turbine cylinder.

The ahead turbine has eleven stages of impulse blading in the high-pressure unit, and seven stages in the low-pressure unit. All blading is of corrosion-resistant metal, heat treated and positively anchored in the rotor and casing. Rotors are of forged steel, finish machined all over and accurately balanced in conformity with specifications of the American Bureau of Shipping and the Bureau of Marine Inspection and Navigation. Nozzle rings, turbine casing and other parts in contact with high-temperature steam are of steel.

The unit is fitted with three bleed connections and suitable bleeder valves to fa-

Boiler room of Fred Morris, showing the fronts of the two Foster Wheeler "D" type steam generators and the Todd burners





Four of the De Laval pumps. Upper left: the IMO type vertical lube oil service; upper right: the two-stage auxiliary condensate; lower left: the auxiliary circulating; and lower right: the two-stage main condensate

cilitate extraction of steam for feed heating. The casings are split along the horizontal center line, and are well supported to permit expansion without distortion. All pockets are drained to the condenser to forestall accumulation of water.

In the exhaust end of the low-pressure casing is a deflector to prevent steam from the astern turbine impinging upon the last row of the ahead blades, and vice versa. There are proper lifting guides to allow casing covers and rotors to be lifted out of the turbine. The condenser is mounted under the low-pressure turbine.

The gear casings are of welded steel construction, with the usual manhole and handholes. The gears are of welded construction with steel rims, and the pinions are heat-treated steel forgings. A Howarth thrust bearing is built into the gear case just ahead of the main gear.

Line shafting furnished by the Camden Forge Company drives a four-bladed solid manganese bronze propeller furnished by Cramp Brass and Iron Foundries. This wheel is 17 feet 6 inches diameter, and its variable pitch reaches 17.84 feet at 0.7 of its radius. Propeller shaft bronze liners were supplied by the Shenango-Penn Mold Co.

Condensers

Exhaust steam from these turbines goes directly into a Foster Wheeler condenser mounted directly under the low-pressure turbine. This condenser has 3650 square feet of cooling surface and is capable of handling 25,200 lbs. of steam per hour and of maintaining a vacuum of 28.5". Each of these condensers will be fitted with a steam jet air ejector for maintaining the vacuum through removal of air and non-condensable gases. The main condensers will be built of welded steel shells and fitted with ¾" aluminum brass alloy tubes, 13 feet long.

The auxiliary condensers, of which there are two per ship, contain 520 sq. ft. of surface each, and have a capacity of 3080 lbs. of steam per hour. The condensing surface will consist of ⅝" aluminum brass alloy tubes 8 feet 6 inches long.

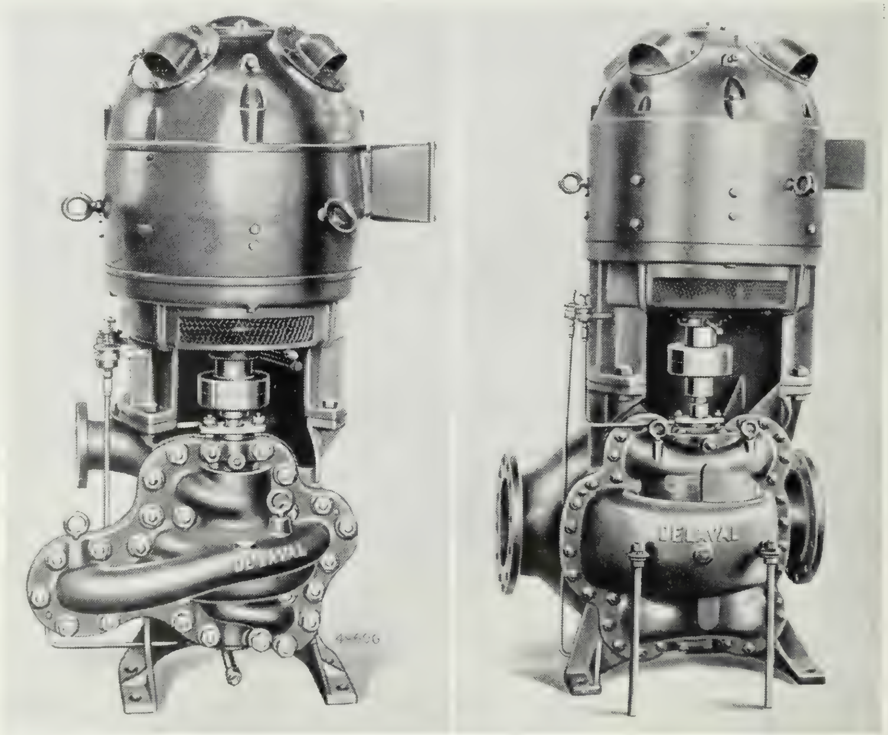
Each pair of auxiliary condensers will be served by a single steam jet air ejector for maintaining vacuum. Condensers and steam jets are by Foster Wheeler.

The steam requirements of the ship are supplied by two marine steam generating units of the two-drum "D" type, set in a single steel casing and installed thwartships just aft of the main turbines and on the upper level of the engine room.

Each steam generator has a 42-inch steam drum, below which is a water drum 32 inches in diameter, the two drums being connected by vertical rows of boiler tubes. The furnace is built at one side of this tube bank, and all furnace surfaces are of water-cooled tubes—four sides and roof—the floor being composed of water tubes also, but covered with high-temperature refractory. All water-wall tubes are 2 inches in diameter, and the water circulation system includes headers at the bottoms of the walls supplied with water through the floor tubes from the water drum. Water-wall tubes extend upward to the top of the furnace, and to the steam drum through direct connections.

Two Todd variable capacity oil burners fire the furnace of each boiler. Hot gases leaving the furnace flow across rows of 2-inch boiler tubes set upon wide centers, and constituting a screen, and thence into the superheater chamber. The connection superheater is of generous proportions, and is placed in a space provided between steam and water drums, and between first and second banks of boiler tubes. Superheater elements are of the "U" bend, bare tube type, 1¼-inch O.D. seamless steel, set horizontally and arranged for self-draining.

Upon leaving the superheater, gases enter the second bank of boiler tubes toward the top, over a steel baffle, and flow down-



Left: The two-stage centrifugal fire pump
Right: The main circulating pump

ward to the water drum. There are thirteen rows of 1¼-inch boiler tubes in this bank. Gases then turn vertically and pass upward through an economizer and through a tubular air preheater to the stack. The economizer is of the high-efficiency, lightweight marine type, composed of 2-inch seamless steel tubes covered with extended surface rings of aluminum, arranged in three groups, between each of which are Vulcan mechanical soot blowers for keeping the surfaces clean. The aluminum rings provide nine times the heat-absorbing surface of bare tubes, and present strong resistance to corrosion and erosion. They are of the same alloy used so succesfully by the Navy for several years.

Final heat recovery is accomplished in an air preheater having horizontal tubes and fitted with four Vulcan mechanical soot blowers. There are two passes of air through the tubes which are easily accessible for internal inspection and cleaning.

The insulation of furnaces and pressure parts of steam generators carrying such high pressure and temperature is exceedingly important, both from the point of view of efficiency and comfort to operators. The insulating requirements for the different portions of "D" type units have been carefully developed and checked many times in connection with the construction of a large number of "Federal" ships, and it has been found that in actual service the heat losses through radiation are insignificant. In calculating heat balances for performance tests of marine steaming units, it has been usual in the past to carry an item for radiation losses. With the present boilers, these losses are so small that they may be disregarded as failing to constitute even a tangible percentage of the actual fuel consumption.

Approximate overall dimensions of the two units as set in the ship are 32 feet beam, 9-foot length, 19 feet high at the steam drum, 12 feet high at the side of the furnace. The boilers, superheaters, economizers and air heaters are by Foster Wheeler.

Each boiler has the following physical characteristics:

Heating surface, boiler and water walls, 2,329 square feet.

Economizer surface, 1,035 square feet.

Air heater surface, 1,075 square feet.

Furnace volume, 485 cubic feet.

The operating conditions are:

Steam capacity, normal, 18,500 lbs. per hour each.

Finned radiating chamber and bimetallic thermostat for control of boiler feed. This unit is mounted on the boiler drum so that the normal water level is mid height of the radiating chamber

Steam capacity, maximum, 27,750 lbs. per hour each.

Design pressure, 525 lbs. per square inch.

Operating pressure at superheater outlet, 465 lbs. per square inch.

Final steam temperature, 765 deg. F.

Mason-Neilan equipment automatically controls combustion air and fuel supply on the boilers of this ship. Wager smoke indicators enable the engineer on watch to keep tab on stack conditions.

Combustion air is supplied to the burners by Sturtevant blowers.

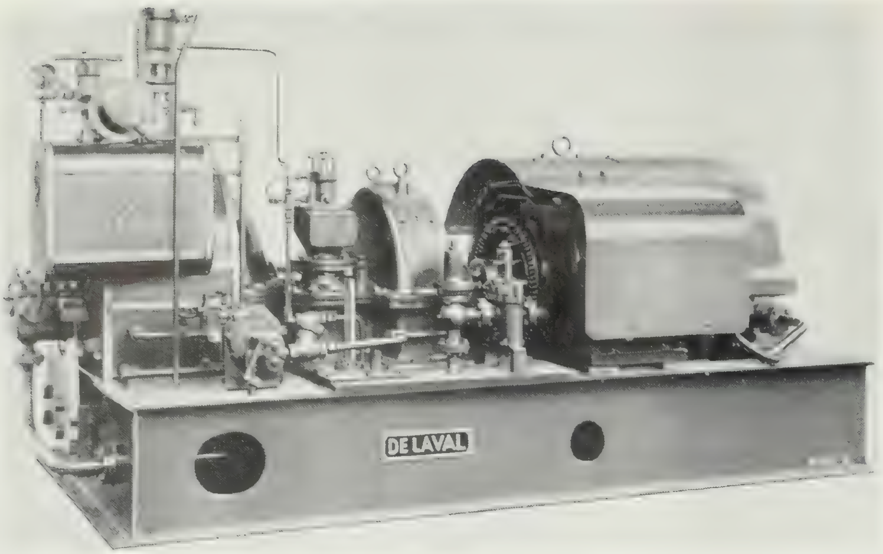
Boiler Feed Control System

An interesting and unusual feature of the machinery installation is the type of high-pressure feed system and boiler water level control used. Each boiler is provided with an individual variable-stroke triplex plunger pump of Aldrich make, taking its suction from the direct contact feed heater and discharging through a two-circuit high-pressure feed water heater directly to the economizer inlet. The boiler water level is controlled by a new design of level controller, developed jointly by Federal and Mason-Neilan engineers. The control regulates directly the stroke of the feed pump to maintain a constant boiler water level under all loads. With this control, the usual feed regulator valve is eliminated, with consequent reduction of feed pump discharge pressure and power of about seven to ten per cent. On trials and in service on the first two ships of this class, the system has proved highly satisfactory in performance and simple to operate and maintain.

The variable-stroke feed pump was developed by the Aldrich Pump Company to combine the efficiency and positive displacement action of the conventional reciprocating plunger pump with the capacity range of a centrifugal pump. The pump operates at constant speed, and variation of delivery is effected by changing the length of stroke through a stroke transformer which is positioned by a hydraulic control cylinder. Oil is admitted to either side of the hydraulic control cylinder by an air-operated pilot valve receiving its impulse directly from the thermostate feed control located on the upper boiler drum. The feed control consists of a finned radiating chamber mounted on the boiler drum, and a bi-metallic thermostat inserted in this radiating chamber. The entire unit is mounted so that the normal water level is approximately at mid-height of the thermostatic chamber. In operation, a change in water level causes a change in thermostat length, operating an air-leakoff valve and changing the air pressure on the diaphragm operating the feed-pump pilot valve.

Auxiliary Machinery

To provide electric energy for auxiliary machinery operation, lighting, heating and cooking requirements, two 250-kw steam turbine gear-driven generators are installed. The turbine is of the De Laval impulse type connected through De Laval speed reduction gearing to a three-wire compound-wound Crocker-Wheeler direct-current generator supplying energy at 120-240 volts. The turbines operate at full boiler pressure and on a vacuum of 28.5 inches; spin at 10,000 rpm while the generator runs at 1200 rpm.



One of the two 250-kw De Laval steam turbine geared drive Crocker-Wheeler generators

Practically all of the pumps in the engine room are electric motor drive, and were supplied by the De Laval Steam Turbine Company. These include:

Main and auxiliary circulating pumps, main and auxiliary condensate pumps, fire pump and bilge pump, all of which are vertical shaft centrifugal pumps with motor mounted above the pump; and lubricating oil service pump and portable cargo oil pumping unit, both of which are of the IMO type. The circulating pumps are made with bronze casings and Monel shafts. Capacity of the main pump is 6400 gpm against a 25-foot 8-inch head, and that of the auxiliary pump is 1600 gpm against a head of 27 feet.

The condensate pumps are of the two-stage type with cast iron casings and Monel shafts, having capacities for the main pump of 80 gpm against 75 psi with a 28.5-inch Hg. suction; and for the auxiliary, 25 gpm against 61 psi with a 28.5-inch Hg. suction.

Also of two-stage type, the fire pump has a capacity of 400 gpm against 127 psi; and the bilge pump will throw out 425 gpm against a head of 28 psi.

The lube oil service pump is a vertical shaft IMO type, and will handle 175 gpm of 200 to 500 SSU oil against 50 psi discharge pressure when working on a 15-inch Hg. suction.

The IMO portable cargo pumping unit will handle 50 gpm of 120 to 2000 SSU oil against 50 psi discharge pressure and 5 psi suction lift.

The standby and auxiliary engine room pumps were furnished by Worthington, as was also the deaerating feed water heater.

Davis Engineering Corporation supplied: salt water, contaminated water and make-up feed evaporators; fuel oil, lubricating oil and feed water heaters; a distiller; and lubricating oil and drain coolers.

The lubricating oil is kept clean by a De Laval lubricating oil purifier.

A two-ton capacity Carrier Freon-12 direct-expansion type refrigerating plant with automatic control for each compartment takes care of the ship's perishable stores.

Deck Machinery

Cargo handling is effected by sixteen American Hoist and Derrick cargo winches, each driven by a 45-hp Westinghouse motor serving sixteen 5-ton cargo booms.

The windlass is driven by a 60-hp Westinghouse motor, and Naco anchor chain is fitted.

Capstan and steering gear were supplied by the McKiernan-Terry Corporation. The steering gear is of the electro-hydraulic single-ram type, and is controlled by hydraulic telemotor and also by Sperry electric control.

The navigating equipment includes RCA radio equipment, a Sperry gyrocompass and gyro-pilot, a Submarine Signal Company fathometer, a Westinghouse searchlight and Bendix mechanical telegraphs. The pilot house windows were supplied by the Kearfott Engineering Company, Inc.

The navigating bridge on C-1-B steamers is notable for its roominess and convenient arrangement

As in all Maritime Commission ships, the quarters on S. S. Fred Morris approximate in comfort and sanitation the best first class liner conditions. Here is a guest stateroom

The life-saving equipment includes lifeboats and davits manufactured by the Welin Davit & Boat Corporation.

The fire protection equipment on this ship was supplied by Walter Kidde & Company, Inc., and consists of a Lux-Rich combined smoke-detecting and carbon dioxide fire-extinguishing system for the cargo compartments, carpenter shop and lamp and paint room. This system consists of a 22-line Rich cabinet and eighty-nine 50-pound-capacity Lux carbon dioxide cylinders. For protection of the machinery spaces, nineteen of the cylinders are arranged for remote manual control. A separate system, using one 50-pound-capacity cylinder with remote control, has been installed to protect the emergency generator room. Also, a 100-pound-capacity hose rack assembly, arranged for local control, has been installed for the protection of the boiler room.

Accommodations

Accommodations for the crew and passengers are located amidships. The ship's refrigerated and dry stores are placed on the second deck over the machinery space. In addition to quarters for eighteen in the deck department, sixteen in the engine department and nine in the steward's department, or a total crew of forty-three, two owner's staterooms are provided on the cabin deck. A combined dining room and lounge for the officers and passengers is provided forward on the cabin deck. Messrooms and lounges for the crew and petty officers are on the main deck, as are the hospital, laundry and galley which is fitted with Edison electrical equipment.

The joiner work and furnishings of the accommodations were handled by Hopeman Brothers. Bendix supplied the general alarm and annunciator systems and telephones, Fred Vogel the hardware and draperies, W. & J. Sloane the rugs, Fred Buse the galley and laundry equipment, Crane the plumbing fixtures, Shaw-Perkins the radiators and Dayton the non-watertight lighting fixtures.

The accommodations are heated and ventilated by two mechanical systems, one port and the other starboard, which receive filtered and preheated air from a common preheater thermostatically controlled. Mechanical exhaust is provided for the toilet spaces and hospital. The ventilating fans were supplied by the Diehl Manufacturing Company, and the air conditioning equipment by the American Blower Corporation.

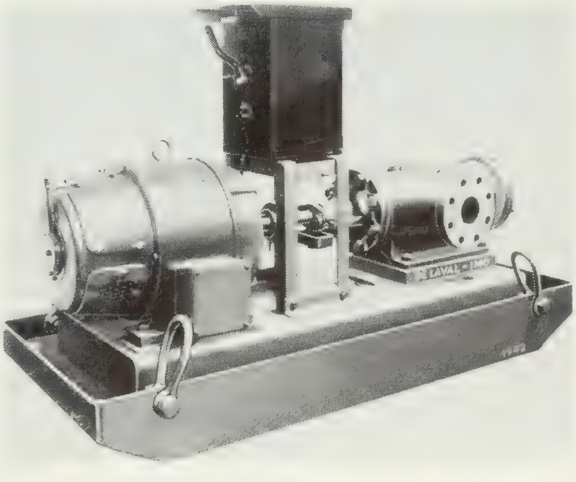
Decorating S. S. America

(Continued from page 38)

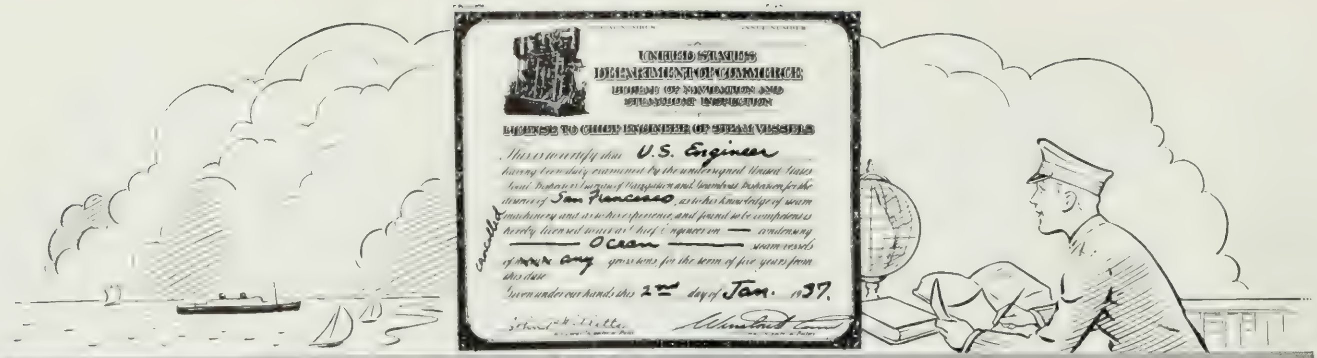
leum, gesso and cast aluminum, as well as paintings on canvas. For three of the most important spaces, three prominent sculptors were chosen to design ornamental bronzes. Also worthy of mention are some of the pictures. Original water-colors by American artists hang in the suites, and Audubon prints in one foyer.

This brief description would not be complete without a tribute to the work of the coordinating committee. These experts in their respective professions gave us the benefit of many helpful suggestions to simplify the application of our work to the technical requirements of theirs. Many problems that at first seemed quite overwhelming were solved through their appreciation of our objectives.

Naturally, we are very proud to have a share in the acclaim accorded this ship America.



A useful item in the pumping equipment of S. S. Fred Morris is this portable De Laval IMO pump for discharging oil cargoes



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MARINE BOILERS

XI—ACCESSIBILITY

QUESTION

Are absolutely all surfaces of a boiler accessible for inspection?

ANSWER

One of the really difficult problems in boiler design is that of maintaining accessibility of all surfaces, joints and parts of a boiler for inspection and cleaning. Much of the boiler detail is specifically for the purpose of permitting inspection or replacement. If these two important requirements could be eliminated, a boiler would be much simpler and lighter. But there must be no unknowns in a boiler. Every surface must be inspected for signs of early failure.

The shape and location of the water tubes is carefully engineered so that any tube, regardless of location, can be removed and replaced without disturbing any other tubes, or, at most, only one or two other tubes. This accounts for some of the peculiar shapes and curves in tubes, and for their sometimes irregular locations.

X—DIRECTED GAS PASSAGES

QUESTION

What is the effect of relative direction of gas flow and water circulation?

ANSWER

Direction of the flow of hot gases has been included among the eleven cardinal points of boiler design because it can so seriously affect economy and life of the boiler.

The direction of flow of gases with respect to the tubes and furnace has been one of the principal differences in modern boilers over older designs, and is the reason for the marked improvements in economy and reduction in boiler weight and weight of water in boiler.

There was a time when the temperature of the hot gas discharged to the stack could not be any cooler than the temperature of the boiling water and steam in the boiler. This was a definite limitation. Interposing the economizer between the boiler and the stack to absorb some heat out of the stack gases was a step in the right direction, but not far enough.

The general theory of "counterflow" has been recognized and adopted as far as possible. This theory pertains to heat transfer from one medium, such as hot gas, to another, such as water. The cool water is introduced into contact with the cooled gases, and as each traverses its directed channels the water picks up heat and temperature as the gases lose heat and temperature, and both arriving at the point of separation have their highest temperature. See Fig. 1, counterflow.

By this method it would be possible to cause the gases to leave at a temperature slightly above the temperature of the in-

Special Letter From "The Chief"

The importance of a thorough knowledge of the marine boiler plant cannot be overestimated, especially to the junior engineers and unlicensed men. With the advance of time you will be promoted, both in grade and responsibility, and at one time the boiler plant will be your principal charge.

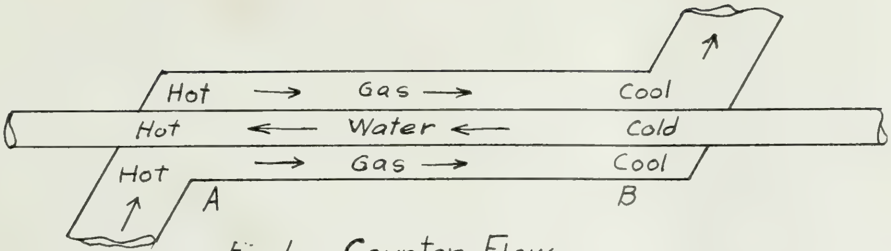
For the present at least, I am not going to discuss the Scotch marine boiler to any extent. There are two reasons for this. First, from the nature of the questions coming in, and that none of them refer to this old and reliable type of boiler, I infer that the problems concerning it are pretty well in hand. Second, the Scotch boiler is thoroughly covered as to shapes, parts, fittings and calculations in the General Rules and Regulations, both the blue book and the 51st Supplement, or brown book.

There are today more Scotch boilers afloat than any other type, and they are still being built. However, they are not being adopted for naval or Maritime Commission ships.

The Scotch boiler is not adapted to high-capacity, high-pressure, low weight per horsepower application. It is, however, the simplest and easiest boiler to build and operate, but not the most economical. It can be built in the shipyard or boiler shop. Modern boilers must be built in machine shops and specialized factories.

I am asking that any who want further discussion on calculations, operation or general questions on the Scotch boiler please write in their problems while we are on the general subject.

"THE CHIEF."



Fi, 1 Counter Flow.

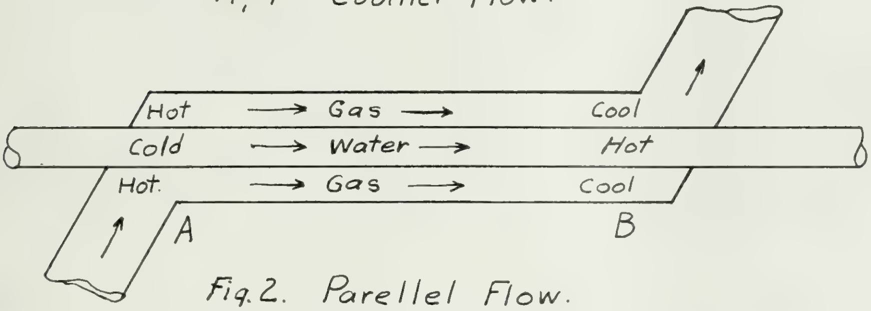


Fig. 2. Parellel Flow.

coming cool water, thus extracting all the heat; and, further, it would be possible to raise the water to as high a temperature as is desired.

Contrast this to Fig. 2, parallel flow. Here the stack gases must be hotter than the hottest water, or else the water returns heat back to the gases, and we are limited in the temperature of both the hot water and cool gases. Furthermore, with the parallel flow we have a very high temperature difference between gases and water at point "A," which would transfer much more at their end than the other end, resulting in overloading one end and underloading the other end of the heat transfer surface. This is not desirable.

QUESTION

Is it possible to follow the counterflow principle in a boiler?

ANSWER

It is impossible to follow the theory of counterflow entirely in modern boilers because the principal heat transfer surface is used for evaporation only; that is, water is introduced to the boiler at practically boiling temperature, and thus all the transfer surface is at the same temperature, that of boiling water.

The economizer may be designed to meet more nearly the counterflow principle, and if it, with the air preheater and superheater are considered part of the boiler, then the counterflow principle is well adapted. However, in modern installations a good deal of feed water heating is done external to the boiler and economizer in the so-called "Regeneration System," which will be discussed at a later date.

QUESTION

Can stack gases be cooled to as low a point as would be economically possible?

ANSWER

Where very hot water is delivered to the economizer, the stack gases on leaving it are still too hot to be discharged to stack, and they are then used to transfer heat to the incoming combustion air to the furnace, thus saving the heat otherwise lost. It is now possible to cool stack gases to as low a temperature as desired with the preheated air, and the lower limit of stack gas temperature is determined by the point of condensation of moisture in the gases.

Engineers' Licenses for December

Name and Grade	Class	Condition
SAN FRANCISCO		
L. Westwick, Chief	SS, any GT	RG
G. W. Woolley, Chief	SS, any GT	RG
C. B. Johnson, Chief	SS, any GT	RG
E. H. Holstead, Chief	SS, any GT	RG
E. W. Alford, Chief	SS, any GT	RG
L. D. Rhea, 1st Asst.	SS, any GT	RG
J. McBride, 1st Asst.	SS, any GT	RG
J. Stevens, 1st Asst.	SS, any GT	O
C. J. Duggan, 2nd Asst.	SS, any GT	RG
R. P. Walker, 2nd Asst.	SS, any GT	O
W. Donnelly, 2nd Asst.	SS, any GT	O
J. B. Franklin, 3d Asst.	SS, any GT	O
M. R. Karvonen, 3d Asst.	SS, any GT	O
V. B. Larsen, 3d Asst.	SS, any GT	O
J. S. Smedley, 3d Asst.	SS. any GT	O
D. W. Hartigan. Chief	MS, any GT	O
J. L. Connolly. Chief	MS, any GT	O
F. J. Burch, Chief	MS, any GT	O
PORTLAND		
F. R. C. Sundquist, Chief	SS, any GT	RG
G. W. Miller, Chief	SS. any GT	RG
A. E. Dappen, Chief	MS, any GT	RG
SAN PEDRO		
N. W. Winberg, 1st Asst.	SS, any GT	RG
L. P. Ackermann, 3d Asst.	SS. any GT	O
G. S. Schweizer, 2nd Asst.	MS, any GT	O
SEATTLE		
E. H. Lawford, 1st Asst.	SS. any GT	RG
E. B. Ellefson, Chief	MS, any GT	RG

Abbreviations: SS is steamer; MS is motorship; GT is gross tonnage; O is original license; RG is raise of grade. All of these licenses are for ocean service.

QUESTION

What is the importance of temperature of condensation or dew point in exhaust gases?

ANSWER

There is considerable hydrogen in fuel oil, which, in being burned, gives water or steam as a product of combustion. Ordinary fuel oil may contain 11 per cent hydrogen, with a lower limit of 9 per cent and an upper limit of 13 per cent. Thus considerable water passes out of the stack. This must not be allowed to condense, as it wets the stack, which, with the small sulphur content of the fuel, forms first sulphurous then sulphuric acid. The effects of this on the stack structure need not be further enlarged upon. The temperature of stack gases must be kept above the dew point of the moisture. This means usually above 350° F. Shore plants will frequently line the breeching and stack with concrete to avoid the condensation limit and acid corrosion.

QUESTION

What is the successive arrangement of the several heating surfaces?

ANSWER

The general arrangement of directed gas flow is the following succession: (1) Furnace 2800° F.; water-cooled walls

(2) Water tubes, 10 per cent of total heating surface; evaporation of steam

(3) Superheater, 20 per cent of total heating surface; superheating

(4) Water tubes, 40 per cent of total heating surface; evaporation of steam

(5) Economizer, 30 per cent of total heating surface; raising hot water to boiling point

(6) Air preheater; raising cold air to approximately 400° F.

(7) Stack; discharging gases to atmosphere at 350° F.

This is accomplished by suitable arrangement of the parts and carefully-designed baffling.

QUESTION

Are the gas passages designed to be as large and free as possible?

ANSWER

Streamlining the gas passages is considered important. The air pressure for forcing air and gases through the boiler is developed from fans, and it is desirable to keep the pressure requirements low. On the other hand, the velocity must be kept high, as the rate of heat transfer goes up rapidly with the increase of velocity of gases over the heating surface. Thus the cross-sectional area of gas passage is carefully determined and maintained small and as nearly the same as possible with a minimum of reversals and bends. Dead spaces are baffled out, and the length of gas passage reduced to a minimum.

All of this may seem quite contrary to that observed in older plants, but these changes pay rich dividends in reduced weight of boiler and water, increased efficiency and capacity, with quickest response to changes in load.

XI—BOILER FITTINGS

QUESTION

What are the required fittings on a marine boiler?

ANSWER

The classical list of boiler fittings required in examinations that pertain principally to the Scotch boiler is as follows:

Main feed valve and check
Auxiliary feed valve and check
Main stop valve
Auxiliary steam stop valve
Safety valves
Water column, with glass
Steam gage
Try cocks
Salinometer cocks
Bottom blow valve
Surface blow valve
Bottom drain valve
Manhole covers
Dampers

The modern boiler adds several necessary fittings, such as:

Smoke detector
Thermometers or pyrometers for superheated steam and stack temperature
Water sampler with cooling equipment
Soot blowers

Forced air dampers, and many other devices which come more under the class of auxiliaries rather than fittings.

QUESTION

What type of safety valve is permitted?

ANSWER

The safety valve is probably the most important fitting. Its specification and number required are fully discussed in the 51st Supplement. Interesting to note is the elimination of the lever or ball weight type. The spring type is found with both internal and external spring arrangement. External spring is required where superheated steam is used. The difference is that the internal spring type subjects the steel calibrated spring of the valve to the temperature of the steam, whereas the external spring type has the spring outside, where it is cooled by surrounding air. At the temperature of superheated steam, the spring may change its calibration or lose its tension somewhat.

All engineers should read carefully and understand the regulations about seals on safety valves and the setting of the valve spring by inspectors.

QUESTION

Are automatic feed valves permitted?

ANSWER

Feed valves on modern ships are nearly always of the automatic type, which holds the water level constant automatically. They are, however, so arranged as to be easily and quickly changed or adjusted manually by the water tender.

QUESTION

Does the height of the mounting of the steam gage affect its accuracy?

ANSWER

This question is often asked regarding the steam gage. The tube connecting it to the boiler is or should be full of condensed water. Thus the height of this column of water adds to the reading of the gage at the rate of .434 pounds per sq. in. for each foot of head of water above the gage. By the same reasoning, the pressure in the bottom drum of the boiler is more than in the steam drum by the head of water in the boiler.

Our next article will discuss the problems of superheater design and of boiler rating.

U. S. M. C. Cadet System

The United States Maritime Commission announced recently that 195 young men successfully completed the third national examination for deck and engineer cadets in the American Merchant Marine, given November 16, 1940.

Out of approximately 15,000 interested in the examination, only 246 qualified under the high scholastic standards set by the Commission. Of this number, the following were successful:

District.	Deck Cadets	Engineer Cadets
Atlantic District	56	44
Gulf District	25	22
Pacific District	26	22
Total.	107	88

These 195 will now be given physical tests by the United States Public Health Service and the Naval Reserve, and, if successful, will be assigned to Maritime Commission cadet schools at New York, San Francisco and New Orleans for preliminary training prior to reporting aboard ships. The successful candidates were from 36 states, the District of Columbia and the Canal Zone.

Appointments will be made from the eligible lists to Cadet Schools as vacancies occur. The total number of cadets under training is limited by the Maritime Commission to a maximum of 400. This program provides approximately 10 per cent of the necessary yearly junior officer replacements in ocean and coastwise shipping. About 65 per cent of the officer replacements are filled by the promotion of unlicensed seamen who have demonstrated ability and passed the examinations of the United States Bureau of Marine Inspection and Navigation. Many of these unlicensed men are assisted by the United States Maritime Service, which conducts training stations and correspondence courses. The other 25 per cent are graduates of four state nautical schools.

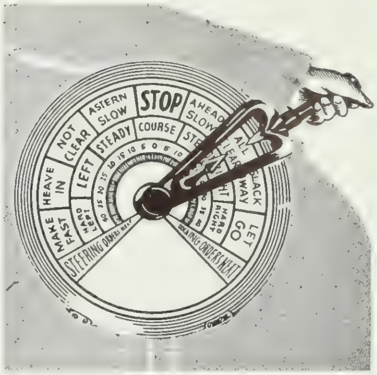
The requirements for cadet appointments are comparable with those of the United States Naval and United States Coast Guard Academies.

Potential needs of the American Merchant Marine are expected to exhaust this list of eligibles within six months. The Commission will announce another examination when it becomes necessary for the filling of probable vacancies. As of December 1, 1940, there were 367 cadets enrolled in the Commission's system and in the training aboard American merchant ships and Army transports. Cadets receive $50 a month minimum pay, with subsistence and quarters.

Licenses as officers are secured after three years' training aboard ship and one year at shore school, and after examination required by the Bureau of Marine Inspection and Navigation of the Department of Commerce.

Steady as you go!

KNOWLEDGE IS THE STRAIGHT COURSE TO ADVANCEMENT



A Department for Deck Officers

by "The Skipper"

Questions Welcomed. Just Address "The Skipper," Pacific Marine Review, 500 Sansome Street, San Francisco, California

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CARGO and STOWAGE

VII NUTS, ORE, and OIL

QUESTION

Where is machinery usually stowed, and why should it be handled with such care?

ANSWER

Owing to the various kinds of packing, variation in dimensions and weight, etc., it is impossible to lay down any clear or defined rules for the stowage of machinery.

If possible, stowage on the "skin" of the lower hold should be kept for the heavy cases, and these may be built around with other cargo. The lighter cases should be given upper stowage but well secured. All cases of machinery should be handled very carefully, as they often contain very light cast iron parts, which, even with the sharp turning over of a case, will be sometimes broken and the machinery seriously damaged.

QUESTION

How would you know if a shipment of maize was in good condition, how should same be stowed and what is known as "sailing grade" and "steamer grade"?

ANSWER

Maize, known as corn in America, is grown and exported in large quantities from Argentina, Southern Russia, Roumania, South Africa, etc., as well as from the United States, where it constitutes the greatest single crop. It is the largest of the cereals, and, besides its value as food for man and animal, is much in demand for the glucose and starch which it yields. It also yields 5 to 10 per cent of oil.

This grain is very liable to heat and sweat, resulting in sourness, and is a cargo subject to heavy damage claims.

In a great number of cases where maize fails to be delivered in good condition, the explanation is to be sought for in the pre-shipment history.

Deck Officers' Licenses for December

Name and Grade	Class	Condition
SAN FRANCISCO		
Y. A. Biggs, Master	SS & MS, any GT	RG
R. Bellero, Chief	SS, any GT	RG
I. E. Rittenburg, Chief	SS, any GT	RG
R. A. Taylor, Chief	SS, any GT	RG
J. J. Hughes, Chief	SS, any GT	RG
J. P. Chiles, Chief	SS, any GT	RG
A. A. Andersen, Chief	SS, any GT	RG
L. C. Olsen, Chief	SS, any GT	RG
H. E. Routery, Chief	SS, any GT	RG
H. Hicker, Chief	SS, any GT	RG
P. H. McBride, Chief	SS, any GT	RG
M. N. Engs, 2nd Mate	SS, any GT	RG
R. C. Burge, 2nd Mate	SS, any GT	RG
H. M. Glick, 2nd Mate	SS, any GT	RG
R. O'Grady, 2nd Mate	SS, any GT	O
F. Blott, 2nd Mate	SS, any GT	O
W. A. Fowler, 3d Mate	SS, any GT	O
D. K. Malina, 3d Mate	SS, any GT	O
C. E. Fosselius, 3d Mate	SS, any GT	O
PORTLAND		
W. P. Connolly, 2nd Mate	SS, any GT	RG
SAN PEDRO		
A. A. Isaac, 2nd Mate	SS, any GT	RG
M. A. Larson, 2nd Mate	SS, any GT	RG
R. J. Armour, 3d Mate	SS, any GT	O
R. P. Combs, 3d Mate	SS, any GT	O
SEATTLE		
D. Murchison, Chief	SS, any GT	RG
C. R. Burt, Chief	SS, any GT	RG
A. N. Abramenkoff, 2nd Mate	SS, any GT	RG

Abbreviations: SS is steamer; MS is motorship; GT is gross tonnage; O is original license; RG is raise of grade. All of these licenses are for ocean service.

It not infrequently happens that maize is stacked in the open, either at the point of loading up-country or at the loading berths. At that time, should it have been inefficiently dunnaged or improperly protected from rain, deterioration will already have set in before shipment.

However, it is almost impossible for other than an expert to detect the "bad condition" of maize at that stage. Some recommend cutting the grain open with a knife, and if the inside is soft, consider the maize to be unfit for shipment; others take a handful of grain and squeeze it, and if the grains are inclined to stick to one another, consider it unfit for shipment.

It will therefore, from the foregoing, be seen that the greatest care should be exercised in protecting ship against claims for damage or deterioration from causes beyond the control of those concerned in its sea transportation. The only safe way of doing that is by suitably qualifying bills of lading. The furthest a master should go in the matter of a clean bill of lading is to accept the words "Shipped in apparent good condition," or "weight, quality, quantity and condition unknown."

Maize is usually classified into two principal grades, *Sailing Grade* and *Steamer Grade.*

Sailing Grade is a well-dried ripe grain specially selected as suitable for transport by sailing ships on long passages.

Steamer Grade is of a softer quality and more liable to heating; for this reason it is only suitable for shipment by steamers on short passages.

When stowing maize, mat and dunnage

thoroughly, especially on stringers, brackets, gussets and other places where condensation is liable to collect. Stow away from boilers, and keep well apart from any cargo such as flour, bran, oats, canned, dry and delicate goods, also wool, which are liable to be damaged by moisture, none of which should be stowed in compartments above maize.

Careful attention should be given to the ventilation of holds.

QUESTION

Where would you stow and how protect a consignment of marble?

ANSWER

Marble is a crystalline limestone much used for decorative and building purposes. It is very heavy and is usually shipped in large slabs or blocks. Marble should be stowed on the hold bottom and care taken to see that the slabs are compactly stowed and not over-stowed with heavy goods. Slabs of moderate size should be stowed on edge like glass, and also slabs in crates.

Do not over-stow marble with greasy, oily or acid-bearing cargo, as the marble will absorb any leakage from such, and claims will quickly follow.

Chain slings should not be permitted to be used for slinging marble, unless for heavy blocks, in which case they should be well protected with leather, etc., to avoid damaging the blocks.

QUESTION

How is molasses carried, and what precautions must be taken?

ANSWER

Molasses is a by-product of sugar, and is much used in preparing rum, and as a food.

In late years it is mostly carried in bulk in tank steamers, but it is also carried in casks, hogsheads and puncheons; when carried in the latter three, considerable leakage may be expected, the loss of weight not infrequently amounting to as high as 10 per cent on long voyages.

This is considered a wet cargo, and contact should be avoided with dry and fine goods. Do not permit the stowage of molasses over even the coarsest sugar, which the West Indian stevedores sometimes try to do.

When carried in bulk in tank steamers, which have been previously in use for oil, the tanks should be thoroughly cleaned by steaming and washing with salt water, and the pipe lines cleaned in the same manner.

In cold weather the molasses gets very thick and is difficult to pump, but it is not advisable, or even permissible, to use steam heaters with it.

In preparing tanks for the reception of other cargo, after discharging molasses, wash with salt water only; fresh water does not lend itself, neither does steam, to this purpose. In view of this, it is the practice, when vessels are proceeding to an up-river port to discharge molasses (and it is expected that tanks will have to be cleaned while up-river), for a ballast tank to be filled with clean sea water before entering the river, in order to ensure a plentiful supply of salt water for tank cleaning purposes.

QUESTION

What would you particularly guard against when motor cars are driven alongside for shipment?

ANSWER

When motor cars are driven alongside for shipment, the fuel tanks and lubricating oil cups, etc., should be thoroughly emptied of their contents and tank plugs firmly screwed in position. Many fires in compartments containing motor cars have been due to neglect of this precaution. Special slings with spreaders should be used for slinging uncrated motor cars, and they should also be landed on thin dunnage and the whole body securely lashed.

QUESTION

Where would you stow nitrate of soda, and what should be particularly guarded against?

ANSWER

Nitrate of soda is a white crystal substance with a bitter taste, used mostly as a fertilizer. It is a natural deposit found encrusting the soil in certain parts of Chile and Peru. It is usually carried in bags, is soluble in water, and as it is liable to evaporate when stowed in a damp place, it must have good dry storage.

Stow clear of fine and delicate goods and well removed from oils and greases. There is an objectionable odor from this cargo, and when stowed in any large quantity it is liable to damage other goods.

In stowing full cargoes of nitrate, it should be stepped up in the holds half bag in from the wings, and also away from the bulkheads, owing to its excessive weight, in order to make the ship ride easy. It settles to a solid mass, and there is no fear of its shifting if stowed as pointed out above.

There is a loss of weight due to drainage which may amount to as much as 3 or 4 percent. The bill of lading should protect the ship against claims from this drainage.

In case of fire, all nitrates intensify the rapidity and violence of the conflagration, so that this cargo should be stowed well away from all cargoes liable to spontaneous combustion.

QUESTION

What are the customary precautions to be taken in the stowage of nuts?

ANSWER

There are many different kinds of nuts valued for their edible or oil-bearing properties, such as almond, brazil, cobnut, coconut and filbert, etc, and they are variously packed in bags, barrels and cases, but mostly in bags, and are also frequently carried in bulk. Nuts are very liable to heat and deterioration. To guard against this, they should be stowed in a dry, cool and well-ventilated place away from engine-room and boilers, and well dunnaged. Edible nuts should not be stowed with guano or bone dust, or any other article liable to damage them. Nuts which have been wetted by rain or other causes should not be shipped until they are thoroughly dry, and the bleeding of bags should on no account be permitted. Some kinds of nuts, especially if new, heat easily and may cause gases dangerous to human life; consequently, good ventilation is essential.

QUESTION

Where and how should oil cake be stowed?

ANSWER

Oil cake is the residue from seeds, such as cotton seed, linseed, Niger seed, sesame seed, Mowra seed, poppy seed, castor seed, etc., from which the oil has been extracted, the "cake" being pressed into shape by various types of presses and used for cattle food.

Oil cakes are shipped both in bulk and in bags or gunny-covered bales, and are apt to dry and lose a lot of weight on the voyage. Care should be taken to see that the hold is dried and the cake well dunnaged, as the slightest damp will often turn the cake moldy and render it useless.

Stow well apart from odorous goods, such as hides, turpentine, etc., to avoid tainting of the cake; and, as the cake throws off an oily, sickly smell which has a tendency to cling to substances, it is necessary that all foodstuffs, including green fruit, be kept well apart from oil cake.

Oil cake often sweats badly on the voyage, and good dunnaging is necessary throughout to ensure as good a circulation of air as possible; but avoid stowing on green or newly-sawn wood, slate, marble or damp ceiling. There is also risk of spontaneous combustion, as several fires have occurred with this cargo. Ventilation should be carefully attended to, and hatches kept open whenever possible.

QUESTION

What care should be given the stowage of various kinds of oils?

ANSWER

The world-wide use of oil for various purposes compels the carrying trade to give special consideration to oil cargoes.

The huge quantities now transported to meet the requirements of modern civilization have necessitated the carrying of the commodity in bulk in specially-constructed vessels, and in these tank steamers many millions of tons of oil are carried annually. The more important oils so carried are benzine, crude petroleum, gasoline, kerosene, fuel oil, naptha, creosote and lubricating oil. Individual companies have their own methods and arrangements, their vessels being especially adapted for their own particular trade, consistent with the class of oil carried and conditions prevailing at the ports of loading and discharge. Oil, however, is still carried as full cargoes and as part of a general cargo, and consequently a brief description of the various types carried and their methods of stowage may not be out of place. In ships other than tank vessels, oil may be carried in three ways, viz. in barrels, in cases and in small quantities in various packings in general cargo.

Some oils, such as lubricating or cylinder oil, are still transported in large quantities in barrels. Frequently barrels of oil are carried in a general cargo, in which case the consignment requires ordinary barrel stowage for liquids. Special care, however, must be taken in the selection of compartment for stowage, bearing in mind the other commodities of which the general cargo may consist. Oil is a source of danger to other cargo, either from itself or from its odor, and must not be stowed amongst other goods which may be damaged by either of these sources, as no matter how well the barrels of oil may be stowed, there is always a risk of leakage. Oil should not be stowed in 'tween or upper decks in a general cargo, but by itself in a portion of the lower holds. If for any reason it is necessary to stow barrels in the 'tween decks, great care must be taken to see that the scuppers are clear to allow any leakage to run direct into the bilges. If the lower hold contains grain, such stowage is not permissible, as if oil gets into the bilges beneath this cargo the grain will be seriously damaged by taint.

In recent years the carriage of case oil has been on the decline. The tendency of many of the large oil companies has been to establish depots to which the oil is carried in bulk, and there canned in their own stations for distribution inland.

When a quantity of case oil is carried as a part of general cargo, the holds must be carefully cleaned and dried and no old or dirty dunnage used. In nearly all ports in the United States, case oil is loaded under the personal direction and supervision of a surveyor appointed by the New York Board of Underwriters, who will insist on cases being stowed according to certain rules formulated as the result of many years' experiment and practical experience. But the fact that the stowage is carried out under this supervision does not exonerate or relieve the ship of the responsibility of taking due care for the preservation and good carriage of all cargo. Although this surveyor is careful to see that the cargo is loaded in such a manner that it is properly stowed, he has no interest whatever in the number of cases taken in a given capacity. In calculating the space for stowage of case oil, it is fairly safe to reckon the stowage capacity as 2 cubic feet to the case. This is over the whole vessel. In large ships in, say, the middle holds, cases will often stow in less space than this; on the other hand, in the end holds and in smaller compartments it will require considerably more space for stowage.

A New Requirement

NOTE—Candidates for second mate's licenses.

No applicant for a second mate's ocean license will be examined who does not possess a gyro certificate of attendance and competency issued by an accredited gyro school. Effective January 1, 1941.

Many men holding third mate licenses are eligible for raise of grade to second mate but they do not know it. You do not have to sail a year as third mate in order to get a raise if you can show a total of five years' sea service in the deck department, two years of which are as quartermaster or boatswain.

If you have been an able seaman in a vessel which does not actually carry quartermasters on the articles, that time counts as quartermaster.

In stowing case oil, the greatest care must be taken to keep all the tiers perfectly level.

It is always customary to floor over the first tier, and in deep holds to floor again after about the fifth or sixth tier.

Cases must on no account be stowed on their flats, except occasionally between the beams on the top tier, where there is not room for an upright case.

Case oil should also be exceptionally well "blocked off" with wood, as the slightest movement when the vessel is rolling will cause chafage and much leakage.

Special rules for the carriage of certain oils in barrels have been laid down by the National Board of Marine Underwriters of America, and may upon request be obtained from them.

Oils are generally classified according to their origin, and are either mineral, vegetable or animal.

QUESTION

What care should be given a part cargo of onions?

ANSWER

Onions are packed in open cases or crates, or in bags of large open mesh. They deteriorate quickly, especially if the ventilation is insufficient, and for this reason lower hold stowage is seldom resorted to. Good ventilation is absolutely necessary, should receive constant attention, and for this purpose the hatches should be kept open whenever possible. They should be loosely stowed, and only goods known to be immune from damage by moisture or by tainting stowed in the same compartment or in one connecting with that in which the onions are carried.

Bags of onions should not come into contact with iron, so that dunnaging of decks, stringers, etc., should be very carefully effected on this account, as well as to avoid bags coming into contact with the water which collects on such parts as a result of the large amount of moisture thrown off by onions, which also makes it necessary for the scupper pipes to be overhauled and cleaned before commencing to load this cargo. The bags are often rotted by the moisture thrown off in the course of short voyages.

Esso Augusta

America's Largest and Most Powerful Diesel-Drive Tanker Built by Sun for Standard Oil Company of New Jersey

One of the latest ships to enter the service of the Esso fleet is the new motor tanker Esso Augusta, built for the Standard Oil Company of New Jersey by the Sun Shipbuilding & Dry Dock Company. The vessel was launched at Chester, Pennsylvania, on June 22 under the sponsorship of Mrs. Edwin S. Hall, whose husband was recently elected a vice president of the Standard Oil Company of New Jersey, and is that company's senior counsel. On October 2 and 3 the Esso Augusta successfully passed a series of rigid trials off Cape Henlopen, during which tests she developed a speed of 16 knots at 97 rpm under Force 4 Beaufort Scale weather conditions.

The Esso Augusta is the first of five diesel ships being constructed in accordance with the owners' policy of keeping abreast of the times in marine engineering developments. The vessel also is the largest Esso ship of this type to be constructed in the United States, and is equipped with the largest Sun-Doxford diesel engine as yet designed and built by the Sun Yard.

The particulars of the Esso Augusta are as follows:

Length overall, 547′ 3¾″.

Length between perpendiculars, 521′.

Breadth molded, 70′.

Depth molded, 40′.

Deadweight tons, 17,950.

Capacity, 152,200 barrels 42's.

Shaft horsepower, 7,500.

Speed, 15½ knots.

Motor tanker Esso Augusta

Main Engine

The Sun-Doxford opposed-piston type propulsion diesel is a five-cylinder-in-line engine, with scavenge air pump cylinder between power cylinders numbers three and four. The five power cylinders are 32″ in diameter and have a combined stroke of 95″. The engine is rated 7,500 bhp at 92 rpm, 8,250 bhp at 95 rpm and 9,375 bhp at 102 rpm.

The welded steel plate bedplate has cross-members arranged to receive spherical cast iron main bearings. The columns, seven in number, are of welded steel, and form A-frames over the main bearings. The frames are tied together to form a unit structure by an entablature which rests on top of and is bolted to the seven frames. The entablature is made in three sections, built up of steel plates and welded, the three sections being bolted together, and provided with bores to receive the cylinders. Openings in these bores coincide with the cylinder scavenging ports. The rear columns of the A-frame are girded together by welded steel box sections which serve to support the cast steel cross-head guides, there being three guides for each cylinder, one for the cross-head of the lower piston and two for the cross-heads of the upper piston. All of these guides are water cooled.

Cylinders

The cylinders are of usual Sun-Doxford construction, each consisting of a liner, open at both ends, with a water jacket shrunk on the center portion. Near the lower end is a circumferential ring of scavenging ports, so shaped as to give the air a swirling motion as it enters the cylinder. The exhaust ports are located near upper end of liner, so that uni-flow scavenging is obtained. Bores through jacket and liner at the mid-point receive an injection valve and air starting valve on front side and a second injection valve, a relief valve, and a brake valve on back side.

Crankshaft and Pistons

The crankshaft is of forged steel, built-up, and consists of five separate sections, one three-crank section for each working cylinder, and one scavenge air pump section, which is located between cylinders three and four.

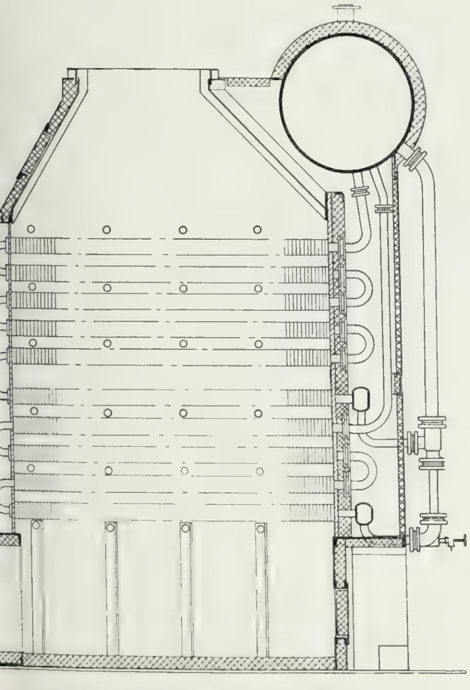
The working pistons are of cast iron, made in two parts, the skirts being bolted to the rods. The heads have concave crowns, so that when the pistons meet at end of stroke, the compression space is of approximately spherical shape, and each is provided with five rings of the plain snap type. Each lower piston is attached by a short piston rod to a forged steel crosshead which works in the center guide. Connection to the center crank is by means of the usual marine-type connecting rod, the length of the rod being 3.82 times the length of the crank throw.

Connection of each upper piston to the crankshaft is by means of a beam attached at its center to the piston and connected at each end to a side crosshead by means of a rod passing down through the cylinder entablature. The two side crossheads are connected to two cranks, one forward and one aft of the center crank, by connecting rods having a length equal to 5.62 times the crank throw. The pistons are fresh water cooled, the inlet and outlet connections being made to the crosshead of lower piston and crossbeam of upper piston by means of swinging arms and flexible rubber tubing.

Braking Arrangement

An interesting feature of the engine is the braking arrangement for stopping the engine quickly when maneuvering. Mounted in the rear of the engine above the camshaft is a group of valve boxes, one for each cylinder, in each of which is a piston valve operated by a cam on the camshaft.

The valve boxes are in communication with and control the operation of brake valves mounted on each cylinder. The cylinder valves are connected in pairs, each pair being in communication with two cylinders, the cranks of which are 144° apart. The cams are timed so that when the valves are cut in during maneuvering, air is discharged to a diaphragm operating the cylinder valves. Both valves in the two cylinders whose cranks are 144° apart are opened when the pistons are at the extreme ends of the stroke and the compressed air in one cylinder is allowed to fill the other cylinder in which pistons are at the outer end of the stroke.



Exhaust-fired boiler

Fuel Pressure Pumps

Fuel under constant pressure is supplied to the injection valves by five plunger pumps, assembled in a single unit at the after end of the engine and driven by gears from the thrust shaft. For maintaining pressure in the fuel lines before the engine is started, a Watson-Stillman vertical two-plunger pump, driven by a two-horsepower motor, is provided.

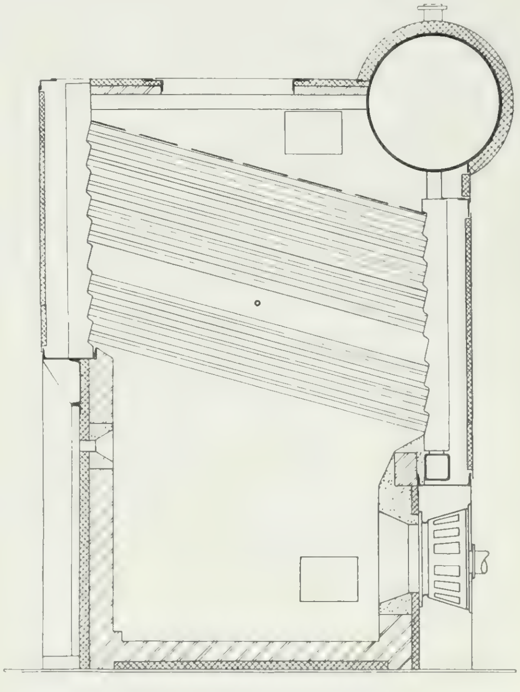
The attached crank-driven scavenging pump, characteristic of the Sun-Doxford engines, has a capacity of 28,500 cu. ft./min.

Safety standards of today require steam drive for tanker cargo pumps, regardless of the propulsion engine. The demand for quick turn-around (which on the Esso Augusta means unloading in 12 hours) requires considerable boiler capacity for the cargo pumps alone, and the steam may also be used to drive other auxiliaries, such as lighting generators, steering engines, various fuel and water pumps. There is also the necessity for cooking, and for seasonal heating of the oil cargo and engine fuel, as well as the ship in general. With the steady increase in size of main engines, the quantity of heat in exhaust gases has risen to a point where its recovery becomes a major factor in the economics of running a motor tanker. Although the temperature of the gases is at a relatively low level, exhaust heat boilers with extended heat-absorbing surface have been developed to such an extent that they can recover the heat needed to generate sufficient steam at high pressure to drive auxiliary machinery—approximately ¾ lb. of steam per shaft horsepower.

Steam Generating Plant

As the result of experience with many other motorships it was decided to make Esso Augusta the first motorship having all of the auxiliaries driven by steam power, either directly or indirectly. As most of the auxiliaries are electrically operated, the greater part of the steam generated is used to drive turbo-generators. The steam generating system must be of high flexibility to accomplish this economically. When the main engine is running at full power, the maximum heat is obtainable from the exhaust, but at low ratings, such as while maneuvering or groping through fog, the value of the exhaust is negligible. A waste heat boiler must recover the maximum heat of which it is capable, at all times, but it has to be supplemented by direct-fired boiler equipment to make up any deficiency in steam generation. While in port, of course, the entire steam load must be carried by direct firing.

These requirements are fully met by using three steaming units—(1) "waste heat," (2) "stand-by," (3) "cargo." The waste heat boiler is placed just above and slightly aft of the main engine, with connections for receiving all exhaust gases. Heating tubes are placed horizontally in a chamber through which the exhaust gases pass vertically. The tubes consist of 2″ seamless U-bend elements upon which are shrunk a series of cast iron gilled rings providing six times the heat absorbing surface per lineal foot that would be presented by the bare tubing. Open ends of the tubes are expanded into a tube sheet, to hold them tightly in place, and coupled together by short U-bends with flanged connections. The return-bend ends of the elements are supported in castings and are free to expand into the surrounding gas-tight chamber,



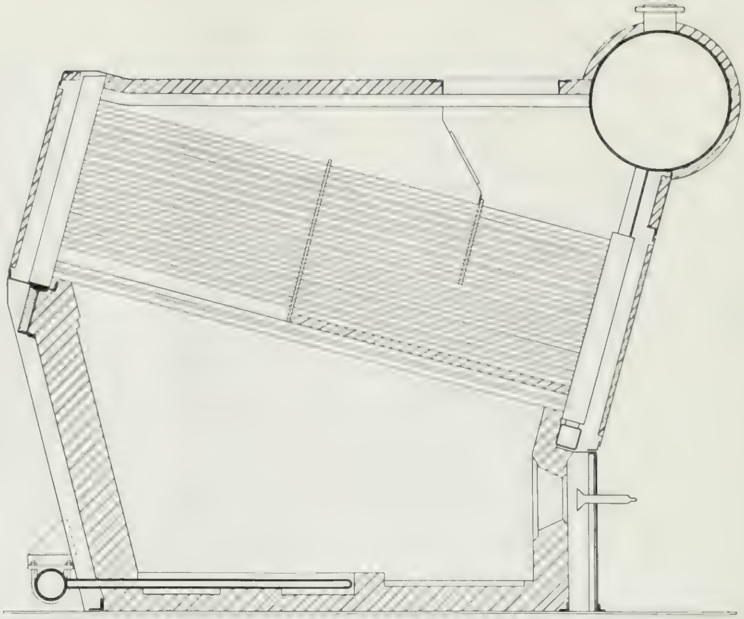
Standby oil-fired boiler

which is heavily insulated to prevent loss of heat.

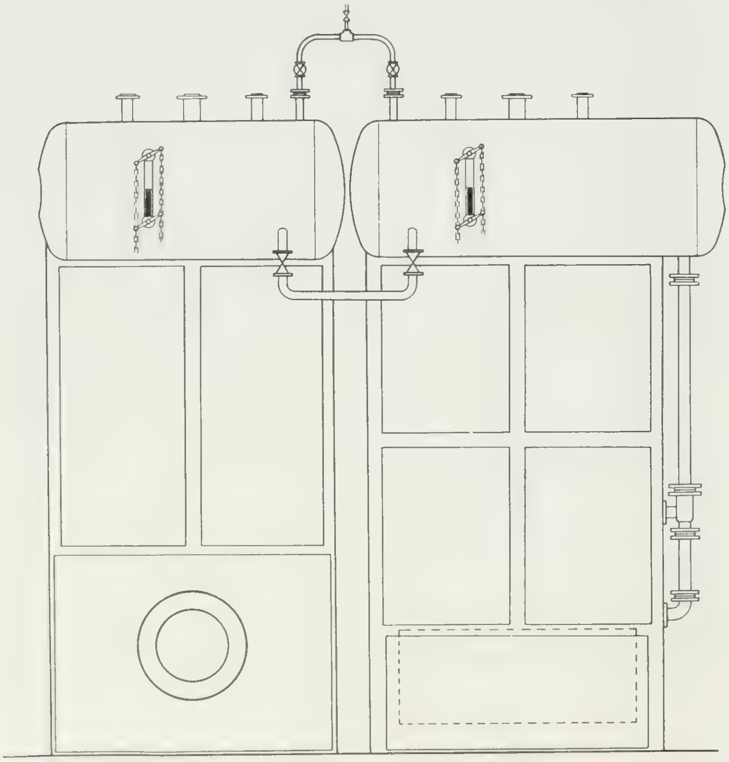
Alongside the waste heat boiler is an independent "stand-by boiler" of orthodox, direct-fired construction, including the usual steam drum, straight tubes, and forged-steel sectional headers into which 2″ diameter tubes are expanded in groups of four. The furnace is of solid refractory construction, fired from the front by a single oil burner to give a capacity of 8000 lbs. of steam per hour at 200-lb. pressure. No superheater is included in either the waste heat or stand-by boilers.

In order to provide the necessary balance in steam generation between the stand-by and waste heat boilers under varying conditions of tanker service, a General Regulator control system maintains full steam pressure by firing the stand-by boiler as required to make up any deficiency in output from the waste heat unit. This control has been accomplished effectively by applying a regulating device to the oil burner. The burner is of rotary-cup, atomizer type, having a special ratio cam box to establish and maintain the proper ratio of primary air to fuel oil. Another adjustment sets the vanes regulating admission of secondary air to the burner.

A special limit switch is provided for use, as desired, in controlling the burner operation. It acts at the extreme end of the regulator travel, at a position corresponding to a steam pressure approximately 5 lbs. per sq. in. above normal. On reaching this position, relay circuits are opened to shut down the burner. With this system, the burner may be operated over its entire range, corresponding to steam demands from 400 to 8000 lbs. per hr., without manual adjustment or any attention by the operator.



Oil-fired boiler for cargo pumps



Waste heat and standby boilers as installed

The "cargo" boiler serves the large bulk oil pumps, and consists of a cross-drum, straight tube, forged-steel sectional-header unit having a capacity of 40,000-lb. steam per hour at 200-lb. pressure and superheated 150 degrees. This unit has 5260 sq. ft. of heating surface, composed of 2″ boiler tubes, divided into three passes of flue gases by conventional fire brick and cast iron baffles. The setting is heavily insulated and provided with removable panels to give easy access for maintenance or repair. Clean tube surfaces are maintained by four mechanical steam soot-blowers placed at the tops of the first, second and third gas passes, and at the bottom of the second and third passes.

The superheater is of the radiant heat type, arranged for two passes of steam, and consists of series of U-bend elements placed flat on the furnace floor with headers just outside the rear wall at floor level. Elements extend about half way from the rear toward the front wall, and are similar, in general, to many floor-type radiant superheaters already in tanker service.

By means of these three boilers, the steam demands of the Esso Augusta are adequately met in a way that is unique on diesel-driven ships. Operation of the direct-fired equipment is so coordinated with the waste heat unit that maximum use is made of the surplus heat in the engine exhaust, and operating efficiency is achieved, together with thorough reliability under all conditions.

Plant No. 2

Seattle-Tacoma Shipbuilding Corporation

If anyone should have any doubt that new shipbuilding records are not about to be made on the Pacific Coast under the Defense Program, he has only to consider ust one trite comparison.

During the World War, when the United States Shipping Board awarded a $100,000,000 contract for merchant vessels to Skinner & Eddy Corporation of Seattle, it was considered a historical incident in shipbuilding annals, especially those of the Pacific Coast, and one never to be exceeded. Yet at the present time there is one yard in Seattle, still under construction, which has a contract with the United States Navy to build 26 destroyers at a total cost of nearly $200,000,000.

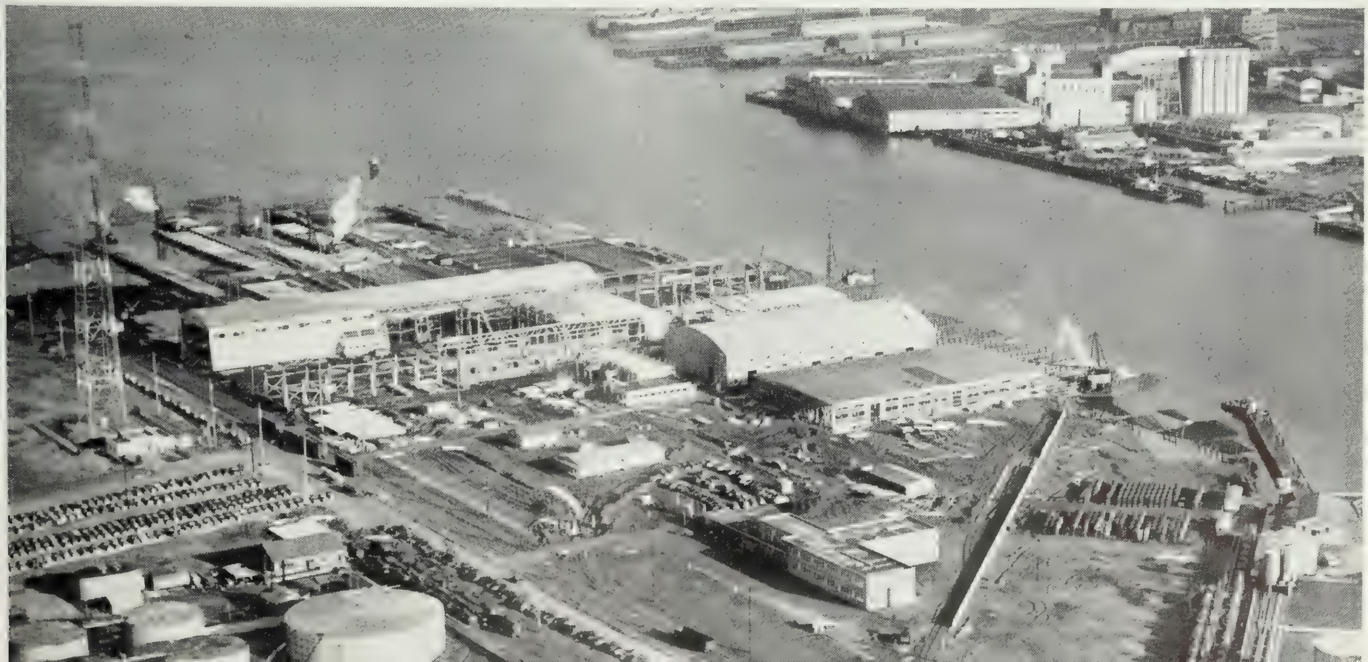
This is Plant No. 2 of the Seattle-Tacoma Shipbuilding Corp., where about 900 men are working day and night to complete in record time one of the finest shipyards in America. Uncle Sam, asking for speed and yet more speed from defense industries, can have no possible complaint in the haste that is being made on this shipyard, for it was only on October 15 that the ground was first broken for the plant, yet it is practically completed, steel for the ships is already being laid down in the yard and the first keel will be laid about April 1. From then on, on five different shipways, accommodating two destroyers each, construction will go forward on the fleet and powerful 2,100- and 1,630-ton destroyers the company has contracted to build.

It will be conceded that three months is a fairly short time in which to build a big shipyard, especially such a shipyard as this one. Going back to our first comparison, it will be recalled that Skinner & Eddy built ships faster than any other yard in the United States, and is even said to have exceeded the records of the Scotch yards on the Clyde. And yet we are assured by an official of the Seattle-Tacoma yard that this yard "was never such a yard as this one will be." That remark applies to equipment and modernity, of course, as the speed at which the yard will turn out vessels is something yet to be determined, and depends to a large extent upon the availability of labor and materials.

The A. J. McEachern Co., Inc., has had the contract for building the yard, which covers a thirty-acre tract on the northeast corner of Harbor Island, with waterfront on two sides. Five shipways, each 400 feet long, 109 feet wide, and extending into Elliott Bay on the north side of the yard, are flanked by craneways for use in handling the heavy material. The plant includes an assembly bay 470 by 90 feet; a fabricating shop 275 by 152 feet; and a layout bay 275 by 60 feet, served by a craneway extending 225 feet toward the East waterway and another extending 200 feet west. Also included in the set-up is a paint shop 100 by 50 feet; a machine shop 175 by 150 feet; a storage warehouse 260 by 150 feet; a mold loft 260 by 130 feet, a restaurant and a fully-equipped hospital.

R. J. Lamont, who is president of the Todd-Seattle Dry Docks, Inc., is also president of the Seattle-Tacoma Shipbuilding Corp. He and J. A. McEachern, vice president of the company and president of the General Construction Co., attended conferences with high Navy officers in Washington, D. C., which resulted in the awarding of the big destroyer contract. These conferences were also attended by John D. Riley, president, and Joseph Haag, Jr., vice president, of the Todd Shipyards Corporation of New York, which has an active interest in this plant as well as in many other shipyards throughout the country.

The new Seattle Plant No. 2 of the Seattle-Tacoma yard should not be confused with Plant No. 1 at Tacoma, which has millions of dollars worth of contracts from the U. S Maritime Commission for the building of merchant vessels, or with the Todd-Seattle Dry Dock Yard, which operates a large repair yard adjoining the Seattle plant on Harbor Island.



Aerial view of Plant No. 2 under construction on December 31, 1940. Note ample space at head of ways and huge proportions of the shops.

Photo by Pacific Aerial Surveys

Pacific NORTHWEST MARINE REVIEW

by D. L. Pratt

Shipbuilding Orders Still Coming

Three new shipbuilding programs, added to the many contracts already received from the Navy, Army and Maritime Commission, have caused much speculation and rumor among shipbuilders of the Pacific Northwest recently. One of these is the President's new $350,000,000 plan for 7,500-ton freighters; the second, the contracts to be let for British ships; and the third, which interests the smaller yards, the Navy's plan for building about 250 auxiliary vessels and the Coast Guard's plans for building twelve 83-foot patrol vessels. Another giant order, still not definitely confirmed, but expected to be placed with the Seattle-Tacoma Shipbuilding Corp., is the Maritime Commission's program for building two 35,000-ton passenger liners convertible into airplane carriers. In the meantime, with these important orders pending, three large definite contracts have been made which considerably increase Northwestern orders already on hand—two mine-layers for the Willamette Steel & Iron Works of Portland; six seaplane tenders to the Lake Washington Shipyards, Houghton, Washington; and four seaplane tenders to the Associated Shipbuilders of Seattle.

Big Contracts for New Portland Yard

Most important announcement from the Columbia River district is of a great new shipyard to be built at Portland by the Portland Shipyard Co., a newly organized firm which has negotiated contracts with the Maritime Commission to build 31 ships, valued at from $1,500,000 to $1,800,000 each. These ships coincide with the President's latest program, although it has been rumored they may be for Britain. They are announced as 7500-ton boats, simple type freighters with a speed of 10 to 11 knots. Chas. A. Shea is president of the new corporation, and is associated with Edgar F. Kaiser of Oakland, and his father, Henry J. Kaiser, president of Six Companies, Inc., builders of Boulder Dam. The yards will have eight shipways, and will be centered on an 87-acre tract leased from the Portland Commission of Public Docks, with options on other land. The plant will cost about $4,700,000. It is expected that over 5000 men will be employed when the plant is in full swing, and possibly as high as 7,000. It is understood that the contract awaits only the approval of the National Defense Commission, as Government funds will be awarded to aid in the plant's construction.

Work on New Yard Starts

As the result of a definite contract for four seaplane tenders from the Navy at an approximate cost of over $18,000,000, and an award of half a million dollars for plant expansion, work was started the second week in January to build a complete new yard for steel hull construction by Associated Shipbuilders. This company is an association of the Puget Sound Bridge & Dredging Co. and the Lake Union Drydock & Machine Co. The shipyard will be erected adjacent to the plant of the former company on Harbor Island, utilizing the big graving docks that were built for the immense concrete pontoons for the Lake Washington floating bridge. The hulls will be built at this plant, then sent around to the Lake Union plant for finishing and installation of machinery. Although just getting under way in their big ship program, the company has already been doing some important work for the Navy in the construction of two large all-steel barges, 110 feet long, 34 feet beam, 11-foot 3-inch draft. First of these, delivered on December 14, holds the distinction of being the first vessel completed on Puget Sound under the Defense Program. The second one was due to be delivered about the middle of January.

Lake Washington Yards Busy

Already working on many millions of dollars worth of Navy vessels, including four submarine net tenders, 4300 baulk tanks for submarine nets and a fleet of auxiliary lighters, the Lake Washington Shipyards at Houghton, across the lake from Seattle, in anticipation of a further order for six new seaplane tenders at an approximate cost of $4,500,000 each, is planning a big program of plant extension, part of which will be financed by a recent Federal allotment of $700,000. The proposed new seaplane tenders are practically identical with two now under construction at the Puget Sound Navy Yard, with a length of 320 feet and similar in design to the 1700-ton destroyers the Navy is building. First self-propelled vessel to be launched for the Navy in the Northwest was sent into the water by this yard on January 10. It was the submarine net tender Aloe, 160 feet in length and powered with diesel engines. She was christened by Mrs. C. S. Kerrick, wife of the port director for the Navy in Seattle.

Builders Plan for Auxiliary Fleet

Nearly a hundred representatives of the smaller shipyards and allied industries in the Pacific Northwest held a conference at the Chamber of Commerce in Seattle on January 14 to discuss with naval officials the plans of the Navy to build 250 auxiliary vessels, both wood and steel. These builders, through their organization, Pacific Northwest Boatbuilders and Allied Industries, have been closely cooperating with the Navy for several months in aiding in a survey of the facilities available. Lieut. Comm. A. L. Hamlin, district material officer for the 13th Naval District, advised them that the survey had recently been completed and forwarded to Washington with a recommendation that the industry in this section is adequately equipped to handle a considerable share of this program, especially the wooden boats. As a result, the Puget Sound boat builders are hopeful of defense contracts soon that will crowd their yards.

The new auxiliary ships will range from 90 to 200 feet in length, and will be used for such purposes as patrol, mine laying and mine sweeping. The present program calls for thirty-six 165-foot steel subchasers, eighteen 165-foot steel minesweepers, thirty 110-foot wooden subchasers, ninety 135-foot wooden minesweepers, fifty 96-foot wooden minesweepers and thirty-two 220-foot steel mine-sweepers, or a total of 170 wooden vessels and 85 steel vessels.

New Coast Guard Ships

In addition to the Navy program outlined above, the smaller builders are also interested in the plans for the construction of twelve 83-foot Coast Guard wooden vessels that are being considered for patrol service on the Pacific Coast. These craft will be powered with 600-hp internal combustion engines. No time had been set for the bids when this was written, but it is understood that several Northwest yards will be in on the bidding. The Coast Guard is also planning to build a steel 65-foot cutter for service on the Upper Columbia River above Celilo, taking care of buoys and other aids to navigation. This boat will be powered with a 350-hp diesel. Bids were submitted by firms in Tacoma, Portland and Astoria, but contract is not announced at this date.

The 35,000 Ton Passenger Liners

On January 16, at the time this is written, the Seattle-Tacoma Shipbuilding Corp. reported that they had received no definite award for the two 35,000-ton passenger liners for the Maritime Commission, on which they were the only bidders. That the company is still hopeful of getting the order, however, is indicated by the fact that they already have tentative plans for a two-million-dollar addition to their plant at Tacoma, where it has been decided to build these ships so as not to interfere with the large Navy destroyer order, which will be started at the new Seattle plant as soon as it is finished.

U. S. Aid for Yard Expansion

Additional aid for both Government and private shipyard expansion in the Puget Sound area was granted in a resolution approved on January 15 by the House Naval Affairs Committee in Washington. The Puget Sound Navy Yard at Bremerton will be allocated $6,000,000; Todd shipbuilding plants, $1,280,000; Keyport Naval Torpedo station, $350,000; Lake Washington Shipyards, $700,000; Associated Shipbuilders, $500,000.

Bids High for Sub Chasers

Two Seattle firms, the Seattle Shipbuilding & Drydock Co. of Ballard, and the Winslow Marine Railway & Shipbuilding Co. of Winslow, bid on the 110-foot sub-chasers for the Navy, but it is understood that their bids were considerably higher than those of many Eastern and Southern concerns. The Seattle Shipbuilding bid was $362,602 for two vessels; the Winslow bid $180,000 for each of six. The apparent low bid was from the Green Bay Drydock Co., Green Bay, Wisconsin; $88,064.25 each for six vessels.

More Jobs For Todd-Seattle

One of fifteen ships formerly owned by the Maritime Commission and sold to Britain, the former Dimon Line intercoastal freighter Pacific Redwood, which has been idle on Puget Sound for nine years, has been towed from Port Orchard to the Todd-Seattle Dry Docks, where she will be overhauled and prepared for service, a job that will take six weeks or more and run into a considerable cost. The vessel was originally built in Seattle by the Ames Shipyards, and is of 5683 tons gross register. Also on the ways at this yard for conversion is the Ancon, which will be converted into a bulk cement carrier at a cost of $100,000. Built at Sparrows Point, Maryland, as the Shawmut, and formerly operated between Seattle and the Orient by the Boston Steamship Co., she has more recently been owned by the Panama Railroad Co., and was purchased from them by her present owners, the Permanente Cement Co. of Oakland, California.

Marine Shorts

Seattle-Tacoma Shipbuilding Corp. was second lowest bidder on the construction of four more diesel-propelled C-2 vessels for the Maritime Commission, being outbid only by the Western Steel & Pipe Co. of San Francisco. Bid by former was $3,471,783; by latter, $3,350,000.

Capt. Harry Crosby of Seattle has ordered a new 56-foot cannery tender from Grandy Boat Co., Seattle, from plans by L. E. Coolidge, tunnel-sterned for shallow water.

Former ferry Redwood Empire of San Francisco has been entirely rebuilt by Black Ball Line of Seattle, placed on Bremerton run under the new name Quiniault, makes a speed of 14½ knots and is fastest double-end ferry on Puget Sound.

The steam schooner **Whitney Olson** was pulled off undamaged from the menacing sands of Clatsop Spit, mouth of the Columbia, on December 16 by the cutter Onandaga.

Oregon Express, 3642-ton carrier of Fruit Express Line, which went ashore on Whisby Island, Puget Sound, is now at Todd-Seattle Dry Docks undergoing repairs.

The well-known tug Tyee, Hubble Towboat Co. of Hoquiam, sank on the Tillamook Bar December 6 with a loss of six men, but at last reports was being successfully salvaged.

Alaska Shipping was up 50 per cent over 1939, and as a result, Seattle waterfront employers paid $539,000 more to dock workers the first 11 months of 1940 than in 1939.

A 110-foot steel lighter built by the **Pacific Car & Foundry Co.** for the Navy had to be towed through the city of Renton on rollers and wooden track before it could be launched in Lake Washington.

Vessels of the **Alaska Line** are now sailing from Pier 1, Seattle, which has been rebuilt into one of the finest terminals on the Coast.

Sagara Maru, one of the most modern cargo carriers, a diesel-powered twin-screw motorship which made 20 knots on her trial trip, attracted much admiration when she was in Seattle on her maiden trip. She is owned by the N.Y.K. and was built by Mitsubishi in Yokahama.

Nine Puget Sound fishing craft were sold recently to Productos Marnios de Guymas, who will operate them together with similar vessels in fisheries along the Mexican Coast, from which Japanese boats have been banned.

Literature of the Industry

The Catalogs of Today Often Become the Handbooks of Tomorrow

Practical Pumping Problems, a sixteen-page booklet published by The International Nickel Company, discusses in detail the uses of Monel, "K" Monel and "S" Monel for pump parts in applications where there is need for high resistance to corrosion, wear, pitting or scoring. This includes different types of pumps, such as reciprocating, centrifugal and rotary pumps.

Part of the book is devoted to a review of case histories. Complete performance data are given on pumps in various applications, which suggest how sizable savings can often be made in maintenance and replacement costs. Much attention is given to the choice of suitable materials for pumps handling a variety of corrosives in a wide range of industries, including power, chemical, municipal water supply, processing, railroad, steamship operation and other diversified fields.

The booklet, which is of a semi-technical nature, was prepared in collaboration with S. A. Tucker and F. A. Annett, associate editors of *Power,* and is being distributed without charge.

Marine Micarta, a new twelve-page illustrated booklet recently issued by Westinghouse Electric and Manufacturing Company and describing Micarta and its uses in marine applications. Particular emphasis is laid on the use of this material for stern tube bearings and pintle bearings. Special features of Marine Micarta, such as low swelling value, smooth, even-wearing qualities, and lubrication features, are described and fully illustrated. A list of ships using Marine Micarta bearings and bushings is given.

The last section of the book is devoted to the application of Marine Micarta to special jobs aboard ships, such as piston rings, valve seats, gears and engine mounting blocks. Ordering information, sketches and explanation of each application are fully covered.

Gasoline Hose, catalog section 4010, a loose-leaf sheet giving complete descriptions of construction as well as cross-sectional photographs of its line of gasoline hose for tank truck and tank car service, has just been published by the B. F. Goodrich Company.

Comparative data, including style, wall reinforcement, material in tube and cover, size, outside diameter and weight in pounds per foot on each of the six types of hose for this service, are listed.

These types are the light flexible with oil-resisting rubber tube; light and flexible with synthetic rubber tube; light and flexible with synthetic rubber tube and cover, semi-flexible with synthetic rubber tube; cotton jacketed, semi-flexible, metal lined with oil-resisting rubber tube and semi-flexible with oil-resisting rubber tube.

Coolers for Lubricating Oil, Catalog No. 31, the Condenser Service and Engineering Co., describes and illustrates the lubricating oil coolers built by that firm.

Construction details, cooling surface, dimensions, rate of heat transfer, capacities and pressure drop, are all listed. A very informative and convenient reference for marine engineers.

Aluminum Gangways, an eight-page booklet with blue, green and black covers, published by the Aluminum Ladder Company. This booklet describes the advantages of aluminum gangways in lightness and strength as compared with conventional construction and materials.

These ladders are made of Alcoa Alloy 53 S.T., which has remarkable strength and weather-resistant properties. Temperatures from 40° F. below to 400° F. above zero have no effect. A gangway 29 feet long, 28 inches clear width, and weighing 400 lbs., will support a distributed load of 6000 lbs. On a 3000-lb. load the deflection at center is less than ¾".

All joints are permanently tight, splinter danger is eliminated, and danger of complete break under heavy strain is avoided, since this alloy will bend but not snap.

Flexible Shafts and Machines, Catalog No. 28, an eighty-page, profusely illustrated book published by N. A. Strand and Company and describing flexible shafts, machines and attachments covering a multitude of applications.

This firm has manufactured this line of machines for thirty-six years, and now has sixty-five types and sizes, both in vertical and horizontal, direct-drive and variable-speed varieties. Their applications cover nearly every line of industry.

Jacket Water Coolers, an eight-page bulletin published by Condenser Service and Engineering Co., Inc., and describing heat exchangers especially adapted for cooling the circulating water for diesel engine cylinder jackets. All necessary technical data, dimensions and capacities are listed and typical piping layouts illustrated. A good reference catalog for the marine diesel engineer.

Performance of Ammonia Condensers, an eight-page pamphlet. One of a series of "Equipment Standards" formulated by Air Conditioning and Refrigerating Machinery Association, Inc. Price 25 cents.

Shows in graphs, with explanatory text, the performance standards for condensers in the vertical open-shell and tube types, and the horizontal closed-shell and tube types.

No. 10 Radiagraph, a new bulletin just published by Air Reduction, New York, discusses in detail this light-weight motor-driven gas-cutting machine, which is widely used by practically every type of metal-working shop. The scope of the standard machine includes cutting straight lines of any length using a track; cutting circles from 3 to 85 inches in diameter; cutting arcs up to a radius of 42½ inches and irregular outlines by manual operation to a limited degree. In any of these operations, cuts can be made having either square or beveled edges. Features of construction are outlined in detail.

The second half of this booklet is devoted to the additional practical cutting operations which can be accomplished with the No. 10 Radiagraph when equipped with simple, easy-to-attach accessory equipment. With these attachments this machine is readily adaptable for plate edge preparation; for making parallel cuts—either circular or straight lines; for structural shape cutting—both channel iron and I-beams and H-beams; and for templet cutting of oval, square or other contours. For each of the special operations, the additional material required to be used with the standard No. 10 Radiagraph is listed, together with a manufacturers stock numbers to facilitate ordering.

No. 4 Radiagraph, an eight-page booklet just published by Air Reduction, New York, featuring a new portable motor-driven gas-cutting machine. The first four pages are devoted to a discussion of the general operation and construction features. This section points out how the machine is ideal for making straight line cuts, for cutting arcs or complete circles and for cutting irregular shapes involving long sweeping curves, either simple or compound. Such operations can be performed with accuracy when making either square or bevel edges.

The second half of the book is devoted to a description of flame hardening and plate edge preparation operations which can be accomplished by using the Standard No. 4 Radiagraph with special, easy-to-attach equipment.

Oxygraph and Travograph Gas-Cutting Machines, a twenty-four-page bulletin featuring the No. 6-A Oxygraph and the Nos. 10, 40 and 41 Travographs, just published by Air Reduction, New York.

These machines will cut an unlimited variety of shapes from steel plate, slabs, billets and forgings. Pages 4 to 13 in this interesting booklet are devoted to excellent examples of the "Visible Evidence of the Scope and Cost-Paring Possibilities" of this group of Airco gas-cutting machines.

All operate on the pantograph principle, so that one or several cutting torches are made to conform exactly to the movement of the tracing device. The second half of the book is devoted to an individual treatment of each of the machines discussed therein. Features of construction and operation are discussed in detail; standard equipment and electrical requirements are listed. The last two pages are devoted to an interesting treatise giving many helpful hints for machine gas-cutting. This material includes an approximate guide for Airco machine gas-cutting, with suggested tip sizes, oxygen and acetylene pressures, cutting speed in inches per minute and approximate gas consumption.

"Midget Marvel" AC Welder, descriptive data 26-320; a new four-page illustrated bulletin published by the Westinghouse Electric and Manufacturing Company, describing the construction and operation features of the "Midget Marvel Flexarc" ac welder. Contained in the bulletin are pictures of the welder, with its outstanding features pointed out and explained. Internal construction is discussed and illustrated.

A comprehensive and informative list of applications gives the reader a lead as to the applications of ac welding in both commercial and industrial fields. Operation costs are discussed, and a graphic chart gives power costs on the "Midget Marvel" in cents per hour of operation.

Ratings, accessory equipment and parallel operation of these welders are fully explained, and a list of answers given to some of the more commonly asked questions about ac welding and its application.

Pressure Filters for Water Purification, Bulletin W-210-B26; and ***Hot Process Water Softener,*** Bulletin W-210-B27; describe Worthington's new filter line. In connection with its entrance into the water purification field, the Worthington Pump and Machinery Corporation of Harrison, New Jersey, announces that it has completed research and design standards for hot process water softeners and pressure filters for all capacities.

Worthington's chemical and other technical departments, as well as its manufacturing facilities, have been supplemented to accommodate the particular requirements of water purification service.

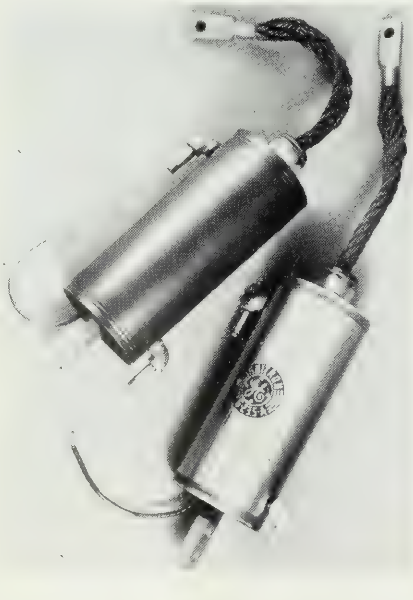
It is stated by the corporation that the new design, in combination with heaters and other water-handling equipment of its manufacture, incorporate certain advantages hitherto unavailable.

Vulcalock Valve, Catalog Section 9787, recently issued by The B. F. Goodrich Company, Akron, Ohio, and giving complete directions for installation and care, as well as a detailed description of the services to which their patented Vulcalock rubber-lined valve is adapted.

Suitable for handling corrosive and abrasive fluids under conditions of fairly high pressure, pulsating pressure, throttling or suction, this product fills the need for a rubber-lined valve of simple, rugged design at reasonable cost.

Diagrammatic sketches showing the easily-replacable parts, together with size data and shipping weights, are included.

New Design In Ignitron Tubes



The old (upper) and the new ignitron tubes

Recognizing that appearance as well as utility is of great importance to the user, the General Electric Company, Schenectady, N. Y., has redesigned its ignitron tubes for resistance welder control. These tubes, which satisfied thousands of users in their former design, now have both inner and outer jackets of stainless steel, and are completely corrosion resistant. The tubes are particularly adapted to welder control service because of their ability to carry very high peak currents for short periods. This characteristic is essential in resistance welding control tubes, since resistance welding depends upon high currents to develop the necessary heat, and the control must respond instantly if it is to follow the signal impulses and so give the desired short and accurate timing. These tubes are available in ratings suitable for controlling nearly all sizes of resistance welding machines.

On the Ways - SHIPS IN THE MAKING

LATEST NEWS FROM AMERICAN SHIPYARDS

New Division in Maritime Commission

The United States Maritime Commission on January 16 announced creation of a Division of Emergency Ship Construction to be responsible for design and layout of new shipbuilding plants or expansion of existing shipyards, and for design and construction of hulls, engines and equipment of ships being built for the national emergency.

J. E. Schmeltzer, Associate Director of the Commission's present Technical Division, was appointed Director of the new Division of Emergency Ship Construction. Prior to his service with the Maritime Commission, he was manager of a number of shipbuilding and ship repair companies.

The Division of Emergency Ship Construction is now arranging for installation of shipbuilding facilities at three shipbuilding companies with which the Commission has contracted for emergency yards.

It will be divided into the following: Hull Section, Engineering Section, Plant Engineering Section, Production Engineering Section, Administrative Section and Trial and Acceptance Section.

The yards which are now establishing plant facilities under contract with the Commission are the Oregon Shipbuilding Company, Portland, Oregon; California Shipbuilding Company, Los Angeles, California; and Houston Shipbuilding Company, Houston, Texas.

Expansion of Federal Yard

The Federal Shipbuilding and Dry Dock Company of Kearny, New Jersey, United States Steel Corporation subsidiary, is proceeding with arrangements to acquire fifteen and one-quarter acres of land which adjoin its property at Kearny for further extensions to its operations.

The property consists of 905 feet of frontage along the Hackensack River and 547 feet of frontage along the Lincoln Highway, and is owned by the Carnegie-Illinois Steel Corporation, largest steel manufacturing subsidiary of United States Steel.

Federal's contemplated expansion consists of additional shipways, an outfitting basin, together with certain other miscellaneous crane equipment and service buildings to provide the facilities necessary to construct its share of the national defense shipbuilding program.

Federal Shipbuilding and Dry Dock Company has on hand orders for the building of 42 naval and 10 merchant vessels. Fifteen ships were completed last year, and more than 10,000 men are presently employed at the Kearny Yards. A large part of the force is working in three shift operations.

Latest tanker for Standard Oil Co. of Californi ready for launching at Sun (see page 28)

California Standard Orders Two Tankers

The Standard Oil Company of California announced on January 28 that plans have been completed for the construction of two ocean-going tankships which will be the largest and fastest vessels of their kind owned on the Pacific Coast.

Details of specifications are as follows: Approximate deadweight capacity 18,200 tons; nine main cargo tanks, with a volumetric capacity of 152,000 barrels; propulsion equipment consists of steam turbines developing 8200 shaft horsepower; overall length 547 feet; breadth 70 feet; depth 40 feet; speed of 15½ knots is specified.

The comfort and safety of the personnel have been recognized throughout the designing, as is characteristic of the entire Standard Oil fleet; especial attention has been given to crew's quarters and in providing a commodious recreation room.

The new craft will augment the present fleet of 18 ocean-going tankers plying under the house flag of this company. They will be used in coastwide and offshore trade, with the home port at San Francisco.

We understand that these two tankers will be built by the Sun Shipbuilding and Dry Dock Co.

Moore Gets Six C-2 Cargo Steamers

The Maritime Commission on January 24 announced award of contracts for six C-2 type steam-propelled cargo vessels to Moore Dry Dock Company, San Francisco, California, on its adjusted price bid of $2,740,000 each, submitted on January 6, 1941.

Commission Finances Tuna Clipper

The Maritime Commission announced on January 13 that bids have been invited for construction of one single-screw tuna fishing boat for the Morgan Fishing Company, a California corporation.

This is the first application approved by the Maritime Commission under Section 509, which permits the Government to finance domestic ship construction without paying a construction subsidy.

The vessel, to be of welded steel construction, will be one of the largest tuna fishing vessels operating out of a United States port. Refrigerating equipment of large capacity will enable it to cover great distances.

Its general dimensions will be:

Length overall	185 feet
Beam	34 feet
Depth	19 feet
Designed speed, loaded	12 knots
Horsepower	1800

Bids will be opened on February 3, 1941, at 12:15 p.m., E.S.T., in Room 7856, Department of Commerce Building, Washington, D. C.

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LOS ANGELES STEEL CASTING COMPANY

Manufactured of Carbon Moly Steel; with tensile strength of 90,000 lbs. per square inch. Tested to 3 times the stated working pressure—metal thickness from ¼" to ½" over specifications — made to meet A.P.I., Marine, Steam, and various other standards. A.S.A. Standards B16E—1939. Steel Specification ASTM A157-C1.

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*NOTE: STAINLESS STEEL FITTINGS MADE TO ORDER.

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Union Oil Orders Two Tankers

On January 27 W. L. Stewart, Jr., vice president of Union Oil Company, announced that contracts have been awarded to the Bethlehem Steel Company in accordance with Union's fleet replacement program for two additional tankers to be built at Sparrows Point.

With a cargo capacity of about 130,000 barrels of gasoline, these ships will be substantially larger than the L. P. St. Clair and the Victor H. Kelly. They will be 501 feet 7¾ inches in length, 68 feet molded beam, 37 feet molded depth, and will have a deadweight carrying capacity at summer freeboard of 16,400 tons. Displacement (salt water) will be 21,500 tons. Delivery is slated for June and July of 1943.

Union Oil Company has one ship under construction at the present time. This ship will be delivered to the West Coast about

S. S. Robin Doncaster just after launching at the Sparrows Point yard of Bethlehem Steel. One of six under construction for the Robin Line of the Seas Shipping Co.

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GENERAL ENGINEERING
and DRY DOCK COMPANY

July 1 of this year. During the past year contracts were placed with the Bethlehem Steel Company for an additional two tankers to be delivered in 1942.

Western Low on C-2 Motorships

The Maritime Commission on January 13 announced receipt of two bids for the construction of another group of C-2 type single-screw cargo vessels, diesel propulsion, as follows:

Seattle-Tacoma Shipbuilding Co., Tacoma, Wash. (yard at Tacoma, Washington)

	Fixed Price Each	Adjusted Price Each
4 ships......	$4,339,729	$3,471,783

The bidder stipulated time for construction of first ship, 620 days; second, 660 days; third, 700 days; and fourth, 740 days.

Western Pipe and Steel Co., San Francisco, Calif. (yard at South San Francisco, Calif.)

	Fixed Price Each	Adjusted Price Each
4 ships......	$3,650,000	$3,350,000

The bidder stipulated time for construction of first ship, 520 days; second, 560 days; third, 600 days; and fourth, 640 days.

A C-2 for Grace Goes to Federal

The Maritime Commission announced on January 16 an award of contract for construction of one C-2 type, steam-propelled, single-screw cargo vessel to be built for the Grace Line, Inc., New York City, to Federal Shipbuilding and Dry Dock Company, Kearny, New Jersey, on its adjusted price bid of $2,250,000, submitted December 10, 1940.

The vessel will be 495 feet overall, beam 63 feet, draft loaded 25 feet 9 inches, sustained sea speed 15½ knots, gross tonnage 6,085 and deadweight tonnage 9,758. She will replace the Grace Line's S.S. Stag Hound, which has been delivered to the Navy Department.

Yes, We Have No Bananas!

The Maritime Commission announced recently that its C-1 type cargo ship MS Cape Lookout would be launched by Pennsylvania Shipyards, Inc., at Beaumont, Texas, on Saturday, January 25, 1941, with the invaluable assistance of ripe bananas.

The objective of a launching is for the vessel to slide promptly from dry land into deep water. For this purpose, juicy bananas have been found an efficient substitute for launching grease.

Seven thousand pounds of bananas will be used in this, the first banana peel launching of a ship of this magnitude. Until now the fruit has been the downfall only of tugs and smaller craft at this yard. However, by increasing consumption of this important Central American export, it is expected to contribute to hemisphere solidarity.

Miss Audrey Louise Jones of Houston, Texas, granddaughter of Secretary of Commerce Jesse Jones, will christen the vessel. Miss Jones is a student at Texas University, Austin, Texas.

New Standards for Employee Health Promotion

Grace Line has just opened a new medical department, which, for completeness of design and method of operation, is considered without precedent in shipping circles anywhere.

Occupying approximately 6,000 square feet between the line's piers 57 and 58, North River, the Medical Department consists of two units, the medical examination and first aid divisions. Each unit has its own individual reception room, consultation room, examination room, dispensary, record room and cubicles with five beds in each section.

The new department is the headquarters of the detailed system by which Grace Line maintains and improves the health of ships' personnel, stevedores, terminal employees and others who work for the line.

Every man or woman employed aboard a Grace Line "Santa" ship is given a thorough physical examination, which includes a check-up of eyes, weight, heart condition, blood pressure, kidneys, lungs, teeth and general physique. Wassermann tests are recurrently given to all those who have anything to do with the kitchen or with the handling of food, providing not only a health safeguard for themselves, but also for all passengers who travel aboard "Santa" ships.

The data acquired at the time an employee is hired are filed in the department's record room and a copy is given to the ship's doctor aboard the vessel to which he is assigned. At the expiration of every four months, each man and woman is notified that he must again undergo a physical examination.

The first aid division of the department was established so that routine check-ups on employees' health would not be disrupted by or interfere with emergency first aid cases.

If an employee is injured while working in New York, or is brought in suffering from any one of the numerous accidents to which all those who perform manual labor are constantly subjected, he is rushed into the first aid section of the department. If the injury is minor, he is treated and discharged or instructed to return for further treatments until completely recovered. If he is hurt seriously enough to warrant hospitalization, the patient, at absolutely no cost to himself, is sent to a hospital nearest his home. All costs are borne by the Grace Line hospitalization plan, for which the employee does not have to pay.

Both the physical examination division and the first aid division of the medical department operate 24 hours a day, seven days a week, two days of which are devoted to examination of female members of ships' staffs. Since its inception, the department has compiled case histories of 7,200 employees.

The dispensary contains supplies of medicines, bandages and instruments, and is thoroughly complete, even to oxygen tanks, so that it can re-equip ships as well as provide necessary items for conducting the work of the department ashore. The department has received the enthusiastic support of the New York Board of Health, which has provided vaccines and medicines in recognition of the fact that the department is contributing so materially to the general health of the city.

The Grace Line Medical Department is under the direction of the medical director of the line, who is assisted by a staff of seven assistant physicians, six registered nurses and three trained medical assistants. Of this staff of 16, a surgeon and a registered nurse are attached to each of the five Grace Line passenger ships which maintain regular service between New York, the Caribbean and the West Coast of South America.

The Medical Director was graduated from McGill University in Canada in 1929 and then put in three years in post-graduate work at the Royal Victoria Hospital at Montreal, followed by two more years in New York Hospital, Cornell Medical Center. He is a member of the surgical staff of the New York Hospital at Cornell Medical Center and of the surgical staff of the City Hospital. He is also a member of the American Medical Association, the New York County Medical Society and the New York Academy of Medicine.

As a result of the complete medical service which Grace Line affords both passengers and crew, "Santa" ships are accorded radio pratique by the health authorities of the Port of New York, which means that the ship's doctor radios in the sanitary condition of the ship and his complete assurance of the good health of all aboard on entering port without those aboard having to submit to medical examinations.

Indication that the personnel of Grace Line fully appreciates the advantages of its medical department is best indicated by records showing the length of employment of crew members aboard the Line's vessels. Since the medical department became available, statistics show that changes in employment have been reduced to nil. As the Medical Director expresses it, "Once aboard our ships, a member of the crew just won't leave."

America's Shipping Lifeline

(Continued from page 27)

tion previously mentioned, and 12 for the Army. By acting for the Navy and Army in this work, the Commission has been able, so far, to maintain at their present high standard the essential trade services, especially those with Latin America. The acquisition program has been carried on with little disruption of normal services. It has meant inconvenience and commercial loss to a number of ship operators, but in all cases fair compensation has been paid.

The Commission has reconditioned ten freighters from its laid-up fleet to be held for national defense uses. All but one of these are now in service, replacing vessels acquired for the armed services or filling new needs created by the defense industrial program.

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Strategic Materials

Then, too, there are the strategic materials essential to our national defense which are produced in whole or in part outside the United States. Many of these strategic materials formerly came from countries which are now blockaded or in zones forbidden to American ships. We have rerouted our vessels to provide for the movement of these vital materials from new-found sources, and in tremendously increased quantities. For example, before the present war began, over 65 per cent of our imports of manganese was carried in British ships. Since this tonnage is no longer available, we have had to divert American ships to insure the movement of an adequate supply for our industries. The same is true of rubber and tin. Total tonnage figures are not available, but the magnitude of this cargo movement is seen in the record of the vessels leaving the Mediterranean last summer after it was barred to our ships. Approximately 40,000 tons of vital raw materials were brought out by 20 American flag ships, principally manganese and chrome ores.

Coordination of Shipbuilding

At the request of Mr. Knudsen, Defense Commissioner in charge of Production, and with the approval of the President, I accepted the additional duties of Coordinator of Shipbuilding. Through the cooperation of the Navy Department, Maritime Commission and the private building yards, it has been possible to award contracts in the manner calculated to produce the largest amount of tonnage in the shortest time.

In this regard, the Maritime Commission's construction program played a vital part in developing and expanding facilities, so that it is possible to produce a two-ocean Navy by 1944. The Commission's program through 1938 and 1939 resulted in the development of eight practically new yards. Some were new from the water's edge back; others had done no building of deep-sea vessels since the end of the first World War.

Sale to British

In still another field of activity have the shipping industry and the Maritime Commission cooperated for the strengthening of United States defenses. I refer to the sale of vessels to Great Britain. Since the present war started, the British have bought 130 ships of all types in this country. Canada has purchased 42 ships. France bought 19, Belgium 9. Of these, 86 of the British purchases were cargo vessels of over 1000 gross tons; Canada's purchases included 14 such cargo vessels. France bought 13 and Belgium 9 of the larger ships—a total of 122 cargo vessels. We can be fairly sure that all these ships, large and small, are now in the British merchant marine.

Most of the vessels purchased in this country were bought from private operators; 21 were bought at public sale from the Commission's Laid-up Fleet. All were transferred with the Commission's consent. Every assistance to the British people is a help in defeating the lawless forces which threaten this country. This aid to Britain has been just as vital as the supplying of airplanes and industrial goods. It has enabled Britain to maintain her flow of vital supplies in spite of a colossal toll of sinkings from submarine, airplane and mine attacks. Her lifeline is her shipping!

This cooperation in replacing Britain's shipping losses will continue. While the Commission's new construction cannot be sold abroad, there is still a small reservoir of old vessels in this country. In this case, aid to Britain is aid to the United States. The British want old vessels because the risk of sinking does not justify a large investment in new. This country has proportionately more overage vessels than does any other important maritime nation. From the vessels already transferred to foreign registry in this war, American shipowners have received over $50,000,000, which the Commission has required to be invested in new construction.

The Future

As to the future, my clairvoyant powers are nil, but I do know we must be alert. We have been fortunate in a preparedness program of four years' standing. We must maintain that forward-looking attitude.

The Commission's Economic Survey of 1937 said, "Shipping, in the first place, is not a business in the usual sense of the word. It is, so far as the United States is concerned, an instrument of national policy, maintained at large cost to serve the needs of commerce and defense." If we all keep that realization uppermost in our thinking, we will continue to be prepared.

The only specific information I can give is that the Merchant Marine Act of 1936 provides: "Whenever the President shall proclaim that the security of the National Defense makes it advisable or during any national emergency declared by proclamation of the President, it shall be lawful for the Commission to requisition or purchase any vessel or other watercraft owned by citizens of the United States, or under construction within the United States, or for any period during such emergency, to requisition or charter the use of any such property."

The Commission is ready to use this power, if necessary. It will use it with the greatest possible consideration for the owners of the property, but that consideration will at no time be superior to the considerations of national interest.

I would like to make it clear that in speaking of the activities and accomplishments in fulfilling the Navy's auxiliary needs and the other requirements for defense, I am speaking of accomplishments by the industry as a whole. The Maritime Commission could not have completed this work without the full and hearty cooperation of countless individuals in the shipping and shipbuilding industries.

May I, on behalf of the U. S. Maritime Commission in general, and myself in particular, express my heartfelt thanks and deepest appreciation for the loyal support of the press, the builders and the operators—in other words the people of the United States who are interested in the American Merchant Marine.

(Abstract of address before the American Merchant Marine Conference, New Orleans, December 10, 1940.)

Notable Merchant Marine Message Reaches Mr. Average Citizen

An Abstract of Radio Talk by New A. P. L. President

"To be adequate a merchant marine must perform a dual role in national defense. First, and most important in time of war, it must function as the good right arm of our Navy, keeping up the service of supplies to our battle force in action and serving as auxiliary wherever and whenever needed. It is a truism that no navy is stronger than its merchant marine auxiliary. The British express this close alliance between their battle fleet and their merchant fleet by referring always to the latter as their "merchant navy." Second, and almost of equal importance, our merchant marine must be strong enough to keep open foreign trade lanes to the sources of vital raw materials not available in this country. We should never, not even under the benign circumstances of world peace, allow our merchant marine to diminish to a point where we would be dependent upon the ships of other nations, however friendly, to provide us with these essential materials, and in turn transport our own exports to our customers abroad."

Query: "Do you favor a strong American merchant marine as a matter of national policy, regardless of whether the world is at war or peace?"

Dr. Grady: "Right! Fortunately, we embarked upon such a policy, after numerous false starts, with the Merchant Marine Act of 1936, which set up the present U. S. Maritime Commission to supervise and administer our shipping problems. This Commission has done, and is doing, a marvelous job in rebuilding our depleted merchant marine. And it is a good thing for us that this far-sighted program of ship construction was started four years ago, when the world was comparatively at peace, rather than to have to undertake it now with all the other vital defense work waiting to be done, and with the available yards now sorely needed for naval craft construction."

Pacific Marine Review *reproduces herewith excerpts from the broadcast aired over San Francisco's KSFO Wednesday, January 15th, when Dr. Henry Francis Grady, new president of the American President Lines, was interviewed.*

Taking advantage of the opportunity of addressing the general public, as distinguished from members of the marine industries, Dr. Grady very wisely planned his remarks accordingly, and the broadcast proved not only interesting, but highly informative. We believe that our readers will find these excerpts well worth their attention. (Editor.)

Query: "Are there any other reasons why it is desirable for America to maintain at all times an adequate merchant marine?"

Dr. Grady: "There is a very sound economic reason, as we have learned twice within one generation. If we have not learned by now, after two world wars, that we must have ships of our own to carry on our foreign commerce when the ships of other nations have been driven from the trade lanes by war, then I would say there is not much hope for us. But I think we have learned this lesson, and learned it well, for all time to come. All of us who are old enough remember the chaos that resulted to our commerce with the outbreak of the first World War. Our merchant marine had been allowed to run down to such a degree that less than 10% of our overseas commerce was being carried in American flag ships. When vessels of the belligerent nations were withdrawn for the purposes of war, our whole foreign trade literally collapsed and our products were piled up in warehouses and elevators and in freight cars all over this country, because there were no ships in which to move them. Almost overnight freight rates on cotton from the Gulf ports to Liverpool jumped ten times the normal rate, and freight rates on wheat which in 1914 had been 8 cents a bushel, ultimately reached a high of $1.36 a bushel.

Our second poignant reminder that it is necessary for America to maintain its own merchant fleet, for national economic welfare apart from defense, came with the outbreak of the second World War. Fortunately, however, as I pointed out before, our far-sighted national administration had already embarked upon a program of shipbuilding and these new ships, plus available old ones built during the rush of the first World War and a few others built under the Jones White Act, enabled us to skid through this emergency without getting too badly hurt. And we are fortifying this position each day under the splendid direction of the Maritime Commission and its accelerated building program."

Query: "You said, Dr. Grady, that your new post as president of the American President Lines appealed to you because it offered challenging possibilities."

Dr. Grady: "There is nothing very profound or mysterious about these 'challenging possibilities.' Fact is I am deeply interested in foreign trade, having devoted many years of my life to study and work in this interesting field. Now comes the opportunity to be engaged actively in a steamship operation which literally serves the world. All things are passing. This war, too, will end in time. And then will come the enormous task of reconstructing world trade on a sound and permanent basis. Economic factors, growing out of dislocations or maladjustments of world trade, are at the root of all major wars. The problems at hand are such as to challenge the imagination of all of us who are interested in future world peace. Working out an equitable system of commodity interchange among the countries of the world is one of the most important tasks confronting mankind today. And when this awful war is over, what is left of civilization will look to America to lead the way back. In short, I am delighted to have the opportunity offered by my association with the far-flung services of the American President Lines to play a small part in this world drama and to have the opportunity to myself apply those sound principles I have always advocated for the working out of the problems of international trade."

PACIFIC MARINE *Reviews*

Thanks . . . and Come Again!

January 4, 1941

Pacific Marine Review
500 Sansome Street
San Francisco, California.

Gentlemen:

"We are enclosing a news item and photograph covering the arrival of the President Jackson in the port of Honolulu, during which Radio Station KGMB did its best to give the listeners of Hawaii a first-hand description of a swell ship.

"I happen to have put in about four years at sea 'way back when, and worked on the good old West Faralon, long since re-christened to the point of becoming habitual. Also the J. L. Luckenbach, the PPL California (now minus a stack, and trying to be a Good Neighbor), and the President Grant and President Taft.

"I gave up seagoing for radio broadcasting, and one of the compensations is to broadcast the arrivals and departures of the Lurline and Matsonia. Extras, from time to time, have included the President Hoover on her way home from being bombed; the President Coolidge, on her first APL voyage and the Empress of Britain on her World Cruise.

"Hope you can find space in a forthcoming issue of the PMR—the Jackson will be back in San Francisco before many weeks, but I hope you will find the enclosed of enough interest to warrant space."

Best wishes.

Sincerely,
Henry C. Putnam
Hawaiian Broadcasting System, Ltd.
Honolulu, Hawaii.

When the new APL round-the-world liner President Jackson arrived in Honolulu, KGMB staff members went off-port and arranged a shipside broadcast from various departments of the big ship. Left to right: Vic Eckland (KGMB); Captain Carl Hawkins, master of the President Jackson; Henry Putnam (KGMB); and Hal Campbell, acting general agent for the APL in Honolulu

News from Hawaii

When the new APL round-the-world liner President Jackson arrived in the port of Honolulu, radio listeners throughout the Hawaiian Islands heard a half hour broadcast over KGMB whose announcers boarded the vessel off-port and arranged a remote control broadcast.

Captain Carl Hawkins, Chief Engineer Mike Doyle and Chief Steward Al Chisholm were interviewed, as were many of the passengers. A feature of the broadcast was a radio-tour of the big liner including a pick-up from the engine room.

U. S. Inspector of Boilers Fred Altman interviewed the Chief on the modern installation in the engine department, as well as on the subject of the safety features of the Jackson.

KGMB Special Events men Vic Eckland and Henry Putnam (engineers' yoeman on the President Grant and President Taft under Chief Putzar) regularly cover the arrivals and departures of the Lurline and Matsonia, interviewing prominent passengers.

Propellers at Los Angeles Hosts to Maritime Cadets

Propeller Club of the United States, Port of Los Angeles No. 66, was host Wednesday noon, January 22, 1941, to the officers and cadets of the California Maritime Academy schoolship S. S. California State, when, aboard the ship tied up at Pier 19, Long Beach, the stewards department served an excellent cafeteria style luncheon.

Ralph J. Chandler, resident manager for Matson Navigation Company and President of the Propeller Club, presided over the gathering which included such guests as Captain Richard B. Coffman, U.S.N., assistant commandant of the 11th Naval District, Mayor Francis Gentry of Long Beach and Harold C. Smith, vice-president of Williams, Dimond & Company, and chairman of the shipping committee of the L. A. Chamber of Commerce.

Captain Claude B. Mayo, U.S.N. retired, superintendent of the S. S. California State. startled his audience of shipping and civic leaders with the prediction that Hitler and his Nazi hordes can not be beaten in the current European War and that the conflict will end in a draw. He declared that the United States is faced with the problem of building a Merchant Marine that must survive in a world of fierce competition.

Pointing out that all of the merchant ship officers of Germany, Italy and Japan are graduates of training schools such as the California State, Captain Mayo said that only ten per cent of American merchant ship officers are school trained. Without special training we can not hope to supply an adequate number of merchant officers for the fleet we are now building.

Captain Mayo included in his short but interesting remarks, a plea for additional support for the school ship. Funds for maintenance of the vessel, he said, are supplied by the state, federal government and from tuition of the cadets. Despite the importance of the training of future officers of American merchant vessels, the school is hampered by lack of adequate shore facilities and by lack of equipment for the study of the modern mechanical equipment of the new merchant vessels.

N. E. DUNNAVANT

Bilge Club News

At a meeting called by President Lloyd J. Moore of the General Petroleum Co., the Directors of the Bilge Club, Los Angeles Harbor's shipping fraternity, met at their headquarters in the California Yacht Club on January 20th to discuss plans for their Thirteenth Annual Banquet. This event will be held as heretofore at the Biltmore Hotel, Los Angeles. The date—Saturday, February 22nd.

President Moore appointed the following chairmen who will choose their own committee members:

Lloyd J. Moore	General Chairman
John Eidom	Entertainment
Capt. T. W. Peters	Attendance
Daniel Dobler	Dinner
E. R. Nelson	Decorations
James Craig	Refreshments
F. G. Nelson and E. J. McKee	Secretarial and Financial
W. A. Mason	Publicity
Fred Archbold	Reception

President Moore also announced that the Twelfth Annual Barbecue and Tournament will be held at the Palos Verdes Golf Club on Saturday, June 21st. Further details of this event will be announced at a later date.

Girard B. Rosenblatt, above, industrial manager for the Pacific Coast District, Westinghouse Electric & Manufacturing Co., has also been named marine manager for the district. A graduate of Columbia University, New York City, Mr. Rosenblatt has been associated with Westinghouse continuously since 1902, and in the West—Butte, Montana; Salt Lake City, Utah, and San Francisco, Calif., since 1905. He became engineering specialist in San Francisco in 1920 and was made industrial manager for the district in 1928.

Westinghouse Promotes Two Coast Men

Girard B. Rosenblatt of San Francisco, industrial manager for the Pacific Coast District, Westinghouse Electric & Manufacturing Co., has also been appointed marine manager for the district, **Chas. A. Dostal,** district manager, announced recently. In addition to supervising the sale of electrical apparatus for marine use, Mr. Rosenblatt will continue to serve as industrial manager.

Mr. Dostal also announced the appointment of Robert M. Campbell of Oakland, Calif., as manager of the Company's Agency and Specialty Division for the district, with headquarters in San Francisco. For the past year Mr. Campbell has served as assistant manager. His promotion enables Mr. Rosenblatt to relinquish the managership of this division and devote time to his new marine work.

Mr. Rosenblatt began his career with Westinghouse at East Pittsburgh, Pa., in 1902, after graduating from Columbia University, New York City, as an electrical engineer. He was transferred west in 1905, serving first in the Company's office at Butte, Mont., then in Salt Lake City, Utah. He came to San Francisco in 1920 as engineering specialist and was named district industrial manager in 1928. A member of numerous engineering organizations and widely known in the electrical and mining industries throughout the West, Mr. Rosenblatt is married, the father of two grown sons, and resides at 66 Santa Ana Ave., San Francisco.

Mr. Campbell received his electrical engineering degree in 1928 at the University of California. After two years with Westinghouse at East Pittsburgh, he was assigned to the Industrial Division, San Francisco office, in 1930. He joined the Agency and Specialties division in 1938, and was made manager in 1939.

Robert M. Campbell, above, of Oakland, Calif., has been appointed manager of the Agency and Specialties Division, Pacific Coast District, Westinghouse Electric & Manufacturing Co. A graduate of the University of California in 1928, Mr. Campbell has been with Westinghouse continuously since that time, and in San Francisco since 1930

Life Saving Head

At the ninety-first annual meeting of The Life Saving Benevolent Association of New York held Thursday, January 16, William D. Winter, president of Atlantic Mutual Insurance Company, was elected president of the Association to succeed Herbert L. Satterlee, who has retired. J. Arthur Bogardus, formerly secretary of the Association, was elected vice president; Percy G. Craig was re-elected treasurer; and Robert F. Livingston, formerly assistant secretary, was elected secretary.

Mr. Satterlee has been president of the Association for the past eleven years and has served for years as an ex officio member of the Committee on Donations and Awards. He will continue as a manager of the Association and a member of the Committee on Awards.

Try George's New Number

In the interest of better service to its many customers George E. Swett & Company, marine sales and service engineers, reports an extension in its telephone service. The new number of the Swett organization is YUkon 2100.

G-E Media and Publishers Relations

The assignment of responsibility to D. S. Mix for Media and Publishers Relations, General Electric Publicity Department, Schenectady, has been announced by R. S. Peare, Manager of G-E's Publicity Department and Broadcasting. Under his new duties, Mr. Mix will have responsibility for the work formerly handled by the late F. R. Davis.

A native of New Haven, Conn., Mr. Mix was graduated from the Sheffield Scientific School of Yale University in 1917, joining General Electric immediately thereafter on editorial work in the Publicity Department. The following year he left the company for military service, returning to G.E. in 1919 when he was again assigned to editorial work in the Publicity Department. After promotional work in the commercial service section of the same department, Mix was made a contact man with responsibility for directing the advertising and sales promotion activities of a large number of G-E apparatus lines.

In 1929, Mr. Mix was made Copy Chief of the department in addition to his duties as contact man. Since 1932, he has devoted his time to Publicity Department training programs, personnel, and special assignments, which he will continue to handle.

Directory Ready

Shipping Register's 1941 Pacific Coast Directory of Transportation is now being distributed by the San Francisco publishing firm, which issues a yearly number. The Directory is a handy reference which gives address and telephone number of all transportation and allied firms of the various ports on the Pacific Coast, from Vancouver, B. C. to San Diego. It is spiral bound for easy handling, and is priced at 50 cents a copy.

Sea Witch

The United States Lines on January 23 announced the purchase of the new C-2 motorship Sea Witch from the Maritime Commission for operation in its American Pioneer Line service. It is the first cargo ship purchased and delivered as part of the line's building program in cooperation with the Maritime Commission.

D. S. Mix elevated to new duties by G. E.

The United States Lines has been operating the Sea Witch since last July in its American Pioneer Line service under charter from the Maritime Commission with the option to purchase. The vessel returned to New York recently from her maiden voyage after calling at Far East and Australian ports.

On her maiden voyage she well exceeded her guarantees in every particular, and is a great credit to those who designed her.

The Sea Witch is the first of nine new cargo vesels of the C-2 class to be employed in both the Australian and Far East services of the Pioneer Line.

The Sea Witch is the first of the C-2 type ships to be equipped with diesel propulsion, and also the first to have hydraulic couplings. She is driven by two Nordberg, 2-cycle, 9-cylinder, direct-reversing diesel engines, each rated 3155 shp at 225 rpm. Each engine is connected by a Vulcan type hydraulic coupling to a Falk single-reduction gear set. This results in a propeller shaft speed of 92 rpm and a total propeller shaft horsepower of 6000. She is 13,900 tons displacement, 459 feet in length, 63 feet beam, and has a service speed of 16 knots.

Crew accommodations of the Sea Witch are outstanding. All 41 of the crew are berthed in the midship house, chiefly in two- and three-berth rooms, and each bedroom has its own lavatory, steel lockers and bed reading lights. The captain and the chief engineer have rooms with private baths. She carries no passengers.

Propellers at Tacoma Hold First Dinner Program

The first dinner and meeting of the Propeller Club, Port of Tacoma, was held last evening, January 28th, at the Tacoma Club.

The retiring President, J. L. Moore, called the meeting to order and the first matter taken care of was the election of officers for the year 1941. The following were duly elected by the members to serve:

President—G. J. Ackerman, Seattle-Tacoma Shipbuilding Corp.

Vice President — Henry Foss, Foss Launch & Tug Co.

Secretary—Chas. C. Cramp, Shaffer Terminals, Inc.

Treasurer — Henry Dufour, Port of Tacoma.

Two new members for the Board of Governors were also voted on. Those elected were Arnaud L. Lefebvre of the Puget Sound Freight Lines and Robert C. Murphy of the St. Regis Paper Co.

Immediately after the election, Past-President Moore introduced our new President, Gil Ackerman, who gave a short talk, giving his ideas of how future meetings could be made more interesting and instructive for the membership.

Mr. Ackerman called for a round-table discussion and many new ideas were brought up. It was decided that representatives of various industries who are members of this Club should give short talks at each meeting, explaining the various phases of his business and what problems might confront them, with the idea that possibly the Club as a whole might help in their solution.

The Club voted to have George Foss of the Puget Sound Freight Lines talk to us at our next meeting, in connection with tariff problems which they now have.

There being no further business, the meeting was adjourned by the new President.

Chas. Cramp, *Secretary.*

Columbian Elects

At the recent election of officers of the Columbian Rope Company of Auburn, N. Y., the following officers were elected for the ensuing year:

Edwin F. Metcalf, Chairman of the Board.

Harold G. Metcalf, Vice-Chairman of the Board.

Stanley W. Metcalf, President.

J. B. Reber, Vice President in Charge of Manufacturing.

S. G. Russell, Vice President in Charge of Sales.

R. L. Morris, Vice President and Comptroller.

F. M. Everett, Secretary.

F. J. Lesch, Treasurer.

Edwin R. Metcalf, Assistant Secretary and General Sales Manager.

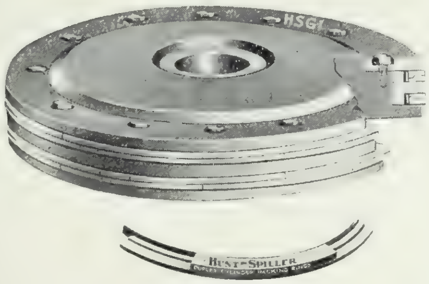
Frank R. Metcalf, Assistant Treasurer.

While this effects some changes in the organization and lessens the activities of Harold G. Metcalf and F. M. Everett, it is not curtailing their interest in the Columbian Rope Company in any way. Together with Edwin F. Metcalf and Stanley W. Metcalf, they are constituting an advisory committee for consultation.

HUNT-SPILLER

Duplex Sectional Cylinder Packing Rings

A Packing Ring that Insures Maximum Power



Typical application of
HUNT-SPILLER DUPLEX SECTIONAL
Packing Ring and Bull Ring

HUNT-SPILLER GUN IRON DUPLEX SECTIONAL PACKING RINGS and BULL RINGS offer an exceptionally economical installation which insures maximum life with steam tight cylinder operation.

HUNT-SPILLER AIR FURNACE GUN IRON, from which these rings are made, is a close-grained material made especially to resist wear at high temperatures. Apply a set and convince yourself of the over-all economies of this sectional packing ring.

HUNT-SPILLER MFG. CORPORATION

383 Dorchester Ave. South Boston, Mass.

V. W. ELLET
Pres. & Gen. Mgr.
383 Dorchester Ave.

E. J. FULLER
Vice President
South Boston, Mass.

Thos. G. Baird
16 California Street
KE-1142
San Francisco

HUNT-SPILLER *Air Furnace* GUN IRON

Mormac Visitor

W. T. Moore, Assistant Vice President of Moore-McCormack Lines, accompanied by his wife, arrived in San Francisco Tuesday, January 28th. He will spend several weeks on the Pacific Coast, familiarizing himself with port conditions and visiting with agents, shippers, and receivers of freight.

Mr. Moore, son of President A. V. Moore, has had an unusual advantage in gaining valuable information in all of the trades in which Moore-McCormack have been engaged. Considerable time was spent by him in Denmark, Norway, Sweden, Poland, and Russia, in the interest of the American Scantic Line which operated from New York. This service of Mormac continued right up to the beginning of World War II, and has been suspended on that account.

In the American Republics Line's service from the Atlantic Coast to the east coast of South America, he has gained considerable experience by spending time in all of the South American offices. Prior to the suspension of Moore-McCormack's Gulf Republics Line, intercoastal service from the Gulf to the North Atlantic, Mr. Moore worked in all of the offices in the Gulf for several months, and now comes to the Pacific Coast to gain the same kind of information by being "on the ground."

Mrs. Moore recently had the high honor of being sponsor for the new cargo and passenger liner Mormacyork, which was launched November 16 at the yard of the Federal Shipbuilding Company, Kearney, New Jersey.

New Name

Pacific Marine Review
500 Sansome St.
San Francisco, Cal.
Gentlemen:

"Since the incorporation of the Enterprise Foundry Company in 1908 our business has changed from a foundry business to a point where it is now indiscriminately known as an engine company and a foundry company.

"We have therefore changed our name to Enterprise Engine & Foundry Company as of November 28, 1940.

"As in the past we will continue to manufacture castings of steel, alloy, gray iron, brass, aluminum, oil burners, diesel and natural gas engines, process machinery and special machinery."

Yours truly,
Enterprise Engine & Foundry Co.
R. E. Kroeck, Assistant Secretary.

John J. Buckley

Sharples Appoints

G. J. Keady, Executive Vice President of The Sharples Corporation, announces the appointment of **John J. Buckley** as Works Manager of the Philadelphia plant of the company. The Sharples Corporation is engaged in the invention, design and manufacture of high speed centrifugals and centrifugal processes.

Mr. Buckley was formerly an executive of the Taft Pierce Company of Woonsocket, R. I., engaged in the manufacture of tools, gauges and precision instruments. He is a member of the American Society of Tool Engineers.

Record Lift

A 226,700-pound turbine armature, the heaviest single piece of freight ever to be shipped on Moore-McCormack Lines to Buenos Aires, capital of Argentina, was loaded on the company's cargo liner Mormacgull, at Pier 3, Hoboken, on Saturday, January 11th.

A special floating derrick loaded the shipment in about one and one-half hours, and no special difficulties arose. The armature, supplied by General Electric, was brought from Schenectady on a railroad car float and is consigned to the Compania Argentina de Electricidad in Buenos Aires.

Shipping dimensions of the armature were twelve feet five inches by eleven feet ten inches by twenty-three feet two inches.

Westinghouse Appoints

William B. Bustard, of Los Angeles, Calif., has been placed in charge of San Diego area sales activities for the Westinghouse Electric & Manufacturing Co., Charles A. Dostal of San Francisco, Pacific Coast District manager for the company, announced recently.

Mr. Bustard will succeed Ronald T. Strong, of San Diego, who has been called to active duty with the U. S. Navy. A Lieutenant Commander, Mr. Strong has been in command of the First Battalion, Organized Reserves. On returning to active duty, he will be attached to the Material Office of the Eleventh Naval District here.

Becomes Pacific Coast Manager

The Pyrene Manufacturing Company, Newark, New Jersey, makers of fire extinguishers and tire chains, announce the appointment of Ben S. Allen as Pacific Coast Manager. Mr. Allen, who has represented Pyrene in Texas for a number of years, will be located at the company's San Francisco office.

His predecessor, Mr. H. B. Weed, has been transferred to Toronto, Canada, to fill the vacancy caused by the death of Gordon C. Brown who was Manager of Pyrene Manufacturing Company of Canada, Ltd.

Gwin C. Harris returns to his home state of Texas to take over the territory formerly handled by Mr. Allen.

Joins Worthington

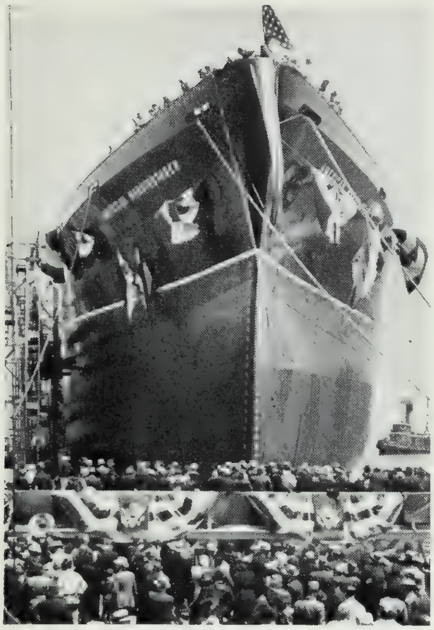
M. P. Robinson, proprietor of the Robinson Filter Company, has joined the Worthington Pump and Machinery Corporation organization to take charge of that corporation's newly organized water purification equipment division. Prior to the establishment of his own water purification company in 1937 Robinson had, for seventeen years, been eastern representative of the International Filter Company of Chicago.

Now P. A.

Effective January 15, 1941, J. W. Richards of Mississippi Shipping Company, Inc., has been designated as Purchasing Agent.

T. V. Major, formerly Purchasing Agent as well as Port Steward, will now, on account of the increase in the line's passenger business, devote his entire time to the duties of Port Steward.

PROGRESS IN *American Shipyards*



Pacific Coast

ASSOCIATED SHIPBUILDERS
Seattle, Wash.

New Construction:

Four seaplane tenders for U. S. Navy.

One 500-ton covered lighter for delivery to U.S. Navy at Puget Sound Navy Yard. **Delivery date January, 1941**

One insulated self-propelled lighter for delivery to U. S. Navy at Puget Sound Navy Yard.

Four small seaplane tenders for delivery to Puget Sound Navy Yard.

Conversion:

City of Newport News to transport.

ASTORIA MARINE CONSTRUCTION CO.
Astoria, Ore.

New Construction:

Hull No. 1100, wood hull troller. 41′ x 11′ x 4′6″; Chrysler Crown engine. Delivery date April 1, 1941.

Hull No. 1090, wood hull trawler for stock. 56′ x 15′6″ x 7′6″; 135-hp Superior diesel engine.

Hull No. 1111, wood hull trawler. 60′ x 12′ x 6′; 100-hp Caterpillar diesel engine. Delivery date April 1, 1941.

BASALT ROCK CO., INC.
Napa, Calif.

New Construction:

Eight steel open lighters; owner, Bureau of Supplies and Accounts, Navy Dept., Washington, D. C. Delivery at Mare Island. 110′ x 34′ x 11′3″. Contract awarded September 5, 1940. **Delivery dates, one per week; first delivered January 20, 1941.**

Eight steel seagoing 1000-ton cargo barges; contractors, Pacific Navy Air Bases. Delivery at San Francisco Bay. 150′ x 40′ x 12′. Contract awarded November 15, 1940.

Two 10,000-bbl. fuel oil tankers for delivery to Mare Island Navy Yard. 235′ x 37′ x 19′; cost $1,800,000. Contract awarded by Navy Dept., Bureau of S. & A., Washington, D. C.

BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Division
(Union Plant)
San Francisco, Calif.

New Construction:

Hulls Nos. 5360-5364, five C-1 cargo vessels for U. S. Maritime Commission. 395′ x 60′ x 37′6″; 6400 gross tons each; 4000 hp. Full scantling steam propulsion type. Keels laid, No. 5363, October 9, 1940; No. 5364, January 15, 1941. **Launching dates,** No. 5360, August 6, 1940; No. 5361, October 4, 1940; No. 5362, **January 10, 1941.**

Twenty-five 2100-ton destroyers for U. S. Navy.

Hulls Nos. 5366-5367, two 1650-ton destroyers for U. S. Navy. Keels laid January 13, 1941.

Four 6000-ton cruisers for U. S. Navy.

BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Division
San Pedro, Calif.

New Construction:

Ten 2100-ton destroyers for U. S. Navy.

COMMERCIAL IRON WORKS
Portland, Ore.

New Construction:

Four anti-submarine net tenders.

CONSOLIDATED STEEL CORP., LTD.
Los Angeles, Calif.

New Construction:

Hulls Nos. 156-159, four C-1-BT, full scantling, turbine propulsion cargo vessels for U. S. Maritime Commission. **Launching dates,** No. 156, November 14, 1940; **February 19,** April 28 and July 24, 1941; delivery dates March 3, June 2, September 4 and November 4, 1941.

Thirty-two steel lighters.

Two transports for U. S. Navy.

GENERAL ENGINEERING & DRY DOCK CO.
Alameda, Calif.

New Construction:

Four anti-submarine net tenders for U. S. Navy.

Four mine sweepers for U. S. Navy.

HARBOR BOAT BUILDING CO.
Terminal Island, Calif.

New Construction:

Hull No. 65, St. George, tuna bait boat for Van Camp Sea Food and Balestreri partners. Length 100′, breadth 25′, depth 11′; 150 gross tons; Fairbanks-Morse diesel, 300 hp; 10 knots speed; cost $160,000. Launched October 6, 1940; **delivery date January 30, 1941.**

Fifteen 60-foot U. S. Navy boats.

LAKE WASHINGTON SHIPYARDS
Houghton, Wash.

New Construction:

Four anti-submarine net tenders.

Four thousand A. S. N. T. floats.

Coast and Geodetic Survey ship.

Six seaplane tenders for U. S. Navy.

LOS ANGELES SHIPBUILDING & DRY DOCK CO.
Los Angeles, Calif.

New Construction:

Hulls Nos. AR6-AR8, three fleet repair vessels for U. S. Navy.

MOORE DRY DOCK CO.
Oakland, Calif.

New Construction:

Hull No. 196, Mormacstar, cargo vessel for U. S. Maritime Commission and Moore-McCormack Company. LOA 492′0″, LBP 465′, breadth molded 69′6″, depth molded 42′6″; shp normal 8500, shp max. 9350; dis. 17,600 tons; deadweight 11,926 tons; steam turbine propelled. **Delivery date January 30, 1941.**

Hulls Nos. 197, Mormacsea; and 198, Mormacsun; two C-3 vessels for U. S. Maritime Commission. LOA 492′0″, LBP 465′, breadth molded 69′6″, depth molded 42′6″. Estimated delivery dates March 1 and March 24, 1941.

Hulls Nos. 199-200, two caisson gates for Bureau of Yards and Docks; one for D. D. No. 2, Pearl Harbor, T. H.; one for D. D. No. 5, Puget Sound, Wash. 150′ x 22′ x 57′; 1800 tons weight. Delivery date May, 1941.

Hulls Nos. 201-203, three cargo and passenger vessels for U. S. Maritime Commission and Alcoa Steamship Co. 442′ x 62′ x 25′; depth molded to bridge deck 41′6″; 8500 hp; 17 knots speed; pasenger carrying capacity 38. **Estimated keel laying dates February 3,** June 16 and September 10, 1941. Estimated delivery dates January 1, March 15 and June 1, 1942.

Hulls Nos. 204-206, three defense vessels for U. S. Navy and Dravo Corp. 110′ x 34′ x 11′3″ molded depth; two diesel-driven generators.

Two submarine tenders for U. S. Navy.

Five submarine rescue vessels for U. S. Navy.

Six C-2 cargo vessels.

Conversion:

Hull No. 195, U. S. S. Tangier, to seaplane tender for U. S. Navy.

OSLON & SUNDE MARINE WORKS
Seattle, Wash.

New Construction:

One 57-foot combination salmon seine diesel boat for Henry Bowman, Wrangell, Alaska. Cost, with equipment, $24,000. Completion date April 1, 1941.

PACIFIC BRIDGE CO.
San Francisco, Calif.

New Construction:

One seagoing drydock for U. S. Navy. Cost $1,649,000.

PACIFIC DRY DOCK & REPAIR CO.
Oakland, Calif.

New Construction:

One all-welded steel oil barge. 148′ x 38′ x 9′; 300,000 gal. capacity.

Lighters. Cost $284,572.

SEATTLE-TACOMA SHIPBUILDING CORP.
Seattle, Wash.

TACOMA PLANT

New Construction:

Hulls Nos. 1-2; 3, Cape Cleare; 4-5; five C-1 cargo vessels for U. S. Maritime Commission. Single screw, full scantling diesel propulsion type. Two General M.A.N. 2100-hp engines; 14 knots speed. **Launching dates, No. 4, February 7, 1941;** No. 5, March 15, 1941. Delivery dates, No. 1, March 1, 1941; No. 2, April 1, 1941; No. 3, May 7, No. 4, July 6, No. 5, September 4, 1941.

Hulls Nos. 6-9, four C-3 cargo ships for U. S. Maritime Commission. 465′ x 69′6″ x 33′; 8900 tons; 8500-hp steam turbine propulsion; cost $2,990,000. **Keel laying dates, February 20,** April 15, July 8 and August 22, 1941. Launching dates, July 1, August 15, November 1 and December 20, 1941. Delivery dates, November 1, 1941, December 4, 1941, January 1 and March 1, 1942.

Hulls Nos. 10-11, two C-3 shelter deck type cargo steamers for U. S. Maritime Commission. To be converted on completion to U. S. Navy troop ships. Keel laying dates, November 8 and December 28, 1941. Launching dates, February 8 and April 6, 1942. Delivery dates, April 5 and May 28, 1942.

SEATTLE PLANT

New Construction:

Twenty-five destroyers for U. S. Navy.

TODD-CALIFORNIA SHIPBUILDING CORP.
Richmond, Calif.

New Construction:

Thirty cargo vessels for British Purchasing Commission. Cost $50,000,000.

TODD-SEATTLE DRY DOCKS
Seattle, Wash.

Conversion work.

WESTERN BOAT BUILDING CO., INC.
Tacoma, Wash.

New Construction:

Hull No. 144, purse seine fishing boat. 95′ x 24′; acquired by U. S. Navy. **Launched January 15, 1941.**

Hull No. 145, fishing boat. 115′ x 26′. Keel laid October 1, 1940.

Conversion:

Fishing boats Majestic and Mahree Star, conversion to naval use.

WESTERN PIPE AND STEEL CO.
South San Francisco, Calif.

New Construction:

Hulls Nos. 57-61, five C-1 cargo vessels for U. S. Maritime Commission. Full scantling diesel propulsion type; single screw; two Busch-Sulzer 2100-hp engines. **Launching dates,** August 8, October 8, December 17, 1940 (est.); **February 15** and April 22, 1941 (est.). **Delivery dates, January 16,** March 17, May 16, July 15 and September 13, **1941.**

Hulls Nos. 62-65, four C-3 cargo ships for U. S. Maritime Commission. 492′ x 69′ x 42′6″; 8900 tons; 8500-hp; steam propulsion; $2,990,000 each. **Keel laying dates, February 28,** May 5, August 1 and September 30, 1941. Launching dates July 15, September 15, December 5, 1941, and January 15, 1942. Delivery dates, February 24, May 5, May 15 and June 24, 1942. All above dates estimated.

Navy life floats.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY
Pittsburgh, Pa.

New Construction:

Thirteen freight barges for Inland Waterways Corp., St. Louis, Mo. 280′ x 48′ x 11′.

Eight dump scows. 160′ x 50′6″ x 13′6″; for Panama Canal.

THE AMERICAN SHIP BUILDING CO.
Cleveland, Ohio

New Construction:

Twelve net tenders for U. S. Navy (6 at Lorain, Ohio; 6 at Cleveland, Ohio). 151′8″ x 30′6″ x 16′6″; diesel-electric propulsion; contract price $6,357,000. Keels laid October 18, 1940.

BATH IRON WORKS
Bath, Maine

New Construction:

Hulls Nos. 182-183, DD437, Woolsey; and DD438, Ludlow; two 1620-ton destroyers for U. S. Navy. Delivery dates May and July, 1941.

Hulls Nos. 184-187, four cargo ships for American Export Line. 400′ x 60′ x 39′. Delivery dates September and October, 1941, and April and June, 1942.

Hulls Nos. 188-189, DD457 and DD458, two destroyers for U. S. Navy. Delivery dates December, 1941, and February, 1942.

Hulls Nos. 190-195, DD449-451, 467-469, six destroyers for U. S. Navy.

Hulls Nos. 196-206, DD507-DD517, eleven destroyers for U. S. Navy.

Hulls Nos. 208-213; DD629-DD631; DD 642-DD644; six destroyers for U. S. Navy.

BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Division
Fore River Yard
Quincy, Mass.

New Construction:

Hull No. 1478, Massachusetts, 35,000-ton battleship for U. S. Navy. Keel laid July 20, 1939.

Hulls Nos. 1479, San Diego; and 1480, San Juan; two 6000-ton cruisers for U. S. Navy. Keels laid March 27 and May 15, 1940.

Hull No. 1484, cargo vessel for U. S. Maritime Commission. 450′ x 66′ x 42′3″; 16½ knots; geared turbines and water tube boilers; 14,500 tons. Launching date November 16, 1940.

Hulls Nos. 1485-1487, three tankers. 502′ x 68′ x 37′; 21,000 tons. Keels laid July 1, August 7 and September 26, 1940.

Hulls Nos. 1488-1491, four tankers for Sinclair Refining Co. 10,700 tons dwt. Keel laid, No. 1488, November 21, 1940.

Hulls Nos. 1492-1493, two tankers for Sinclair Refining Co. 15,450 tons dwt.

Hulls Nos. 1494-1497, four heavy cruisers for U. S. Navy.

Hulls Nos. 1498-1501, four light cruisers for U. S. Navy.

Hulls Nos. 1502-1503, two light cruisers for U. S. Navy.

Hulls Nos. 1504-1507, four heavy cruisers for U. S. Navy.

Hulls Nos. 1508-1511, four aircraft carriers for U. S. Navy.

Hulls Nos. 1512-1515, four trawlers.

Hulls Nos. 1516-1519, four 1650-ton destroyers for U. S. Navy.

BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Division
Sparrows Point Yard
Sparrows Point, Md.

New Construction:

Hulls Nos. 4341, Robin Locksley; 4342, Robin Doncaster; 4343, Robin Kettering; three cargo vessels for Seas Shipping Co. LOA 485′, beam 66′, draft 43′. **Launching dates,** No. 4341, October 5, 1940; No. 4342, December 7, 1940; **No. 4343, January 18, 1941.**

Hulls Nos. 4345, Lipscomb Lykes; 4346, Thompson Lykes; 4347-4348; four C-1 cargo vessels. LOA 417′, LBP 395′, beam 60′, depth 37′6″. Launching date, No. 4346, December 21, 1940. **No. 4345 delivered January 10, 1941.**

Hulls Nos. 4350-4352, three cargo vessels for Seas Shipping Co. 450′ x 66′ x 34′; 6300 hp; 8500 gross tons.

Hulls Nos. 4353-4356, four oil tankers for Socony Vacuum Oil Co. 487′6″ x 68′ x 37′; 12,000 hp; 9,800 gross tons.

Hull No. 4357 oil tanker for Union Oil Co. of Calif. 442′ x 63′ x 34′10″; 3500 hp; 8000 gross tons.

Hulls Nos. 4358-4359, two oil tankers for Socony Vacuum Oil Co. 487′6″ x 68′ x 37′; 12,000 hp; 9800 gross tons.

Hulls Nos. 4360-4361, two oil tankers for Union Oil Co. 442′ x 64′ x 34′10″; 3500 hp; 8000 gross tons.

Hulls Nos. 4362-4364, three cargo and passenger vessels for Mississippi Shipping Co. 465′ x 65′6″ x 39′9″; 8600 hp; 8300 gross tons.

Hull No. 4365, oil tanker for Richfield Oil Co. 442′ x 64′ x 34′10″; 3500 hp; 8000 gross tons.

Hulls Nos. 4367-4368, two oil tankers for Panama Transport Co. 487′6″ x 68′ x 37′; 7000 hp; 9800 gross tons.

Hull No. 4369, oil tanker for Continental Oil Co. 442′ x 64′ x 34′10″; 3500 hp; 8000 gross tons.

Hulls Nos. 4371-4372, two oil tankers for Gulf Oil Co. 442′ x 64′ x 34′10″.

BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Division
Staten Island Yard
Staten Island, N. Y.

New Construction:

Hulls Nos. 8015-8019, five C-1-B design cargo vessels for U. S. Maritime Commission. 417′9″ x 60′ x 37′5″. Launching dates, No. 8016, November 2, 1940; No. 8017, December 28, 1940; No. 8018, March 15, 1941; No. 8019, April 15, 1941. **Delivery dates, February 4,** April 1, June 1, August 15 and October 1, 1941.

Hulls Nos. 8021-8022, two destroyers for U. S. Navy.

Hulls Nos. 8023-8032, ten destroyers for U. S. Navy.

IRA S. BUSHEY & SONS, INC.
Brooklyn, N. Y.

New Construction:

Hull No. 486, tug. 100′; 805-hp F-M diesel. Delivery date, May, 1941.

Hull No. 490, tug. 90′; 805-hp F-M diesel. Delivery date, July, 1941.

Hull No. 491, wooden drydock section for Bethlehem Steel Co. Delivery date 150 days.

Hull No. 493, tug. 100′; 805-hp F-M diesel. Delivery date, May, 1941.

Hull No. 494, tug. 90′; 805-hp F-M diesel. Delivery date, July, 1941.

CRAMP SHIPBUILDING COMPANY
Philadelphia, Pa.

New Construction:

Six cruisers, Cleveland class, for U. S. Navy.

DEFOE BOAT & MOTOR WORKS
Bay City, Mich.

New Construction:

Hull No. 167, PC452, sub-chaser for U. S. Navy. 174′ long. Delivery date May, 1941.

Hulls Nos. 168-170, YT149-YT151, three harbor tugs for U. S. Navy. 100′ long. Delivery date, March, 1941.

Hulls Nos. 171-174, four mine sweepers for U. S. Navy. 220′ long.

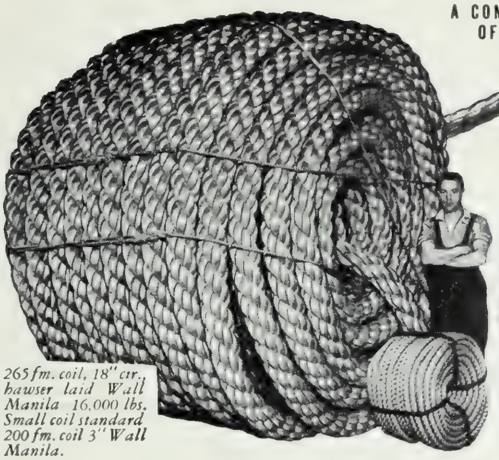
Twelve 165-foot escort vessels for U. S. Navy.

THE DRAVO CORPORATION
Engineering Works Division

Pittsburgh, Pa., and Wilmington, Del.

New Construction:

Hulls Nos. 1699-1701, three welded car-



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333 Montgomery St., San Francisco, Cal.

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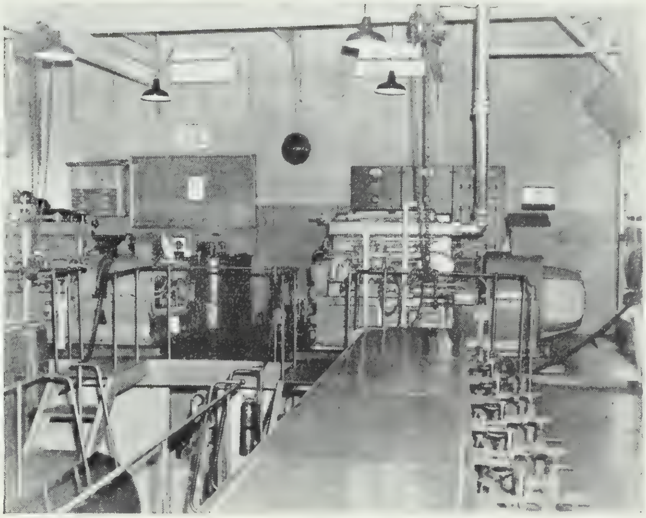
The "NATIONAL", recently launched, is under way with Superior Diesel power throughout.



THE "NATIONAL", the latest and in many respects the finest yet to be added to progressive American Barge Line Company's fleet, was built by Jeffersonville Boat and Machine Company, Jeffersonville, Indiana . . . Four large river boats have now been powered by Superiors for American Barge Line, a definite tribute to the success of these engines in service where comparisons in results are carefully studied and followed.

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floats for Pennsylvania R. R., Philadelphia, Pa. 250' x 34' x 9'1"; 1782 gross tons.

Hulls Nos. 1740-1749, ten type W-7 welded coal barges for stock. 175' x 26' x 10'8"; 4720 gross tons.

Hull No. 1750, 1300-hp twin-screw diesel towboat for stock. 176' x 36' x 10'; 590 gross tons.

Hull No. 1751, 760-hp twin-screw diesel towboat for stock. 145' x 27' x 11'9"; 318 gross tons.

Hulls Nos. 1757-1759, three welded coal barges for M. & J. Tracy, Inc., New York City. 134' x 34' x 17'; 2301 gross tons.

Hulls Nos. 1764-1767, four welded sand and gravel barges for Warner Co., Philadelphia, Pa. 130' x 34' x 10'; 1808 gross tons.

Hulls Nos. 1768-1775, three steel lighters for U. S. Navy Dept., Washington, D. C. 110' x 34' x 11'3"; 2672 gross tons.

Hulls Nos. 1776-1780, five covered cargo barges for stock. 175' x 26' x 11'; 2650 gross tons.

Hulls Nos. 1781-1784, four covered cargo barges for River Terminals Corp., New Orleans. 2612 gross tons.

Hulls Nos. 1785-1790, six sand and gravel barges for Keystone Sand Division. 135' x 27' x 8'; 1530 gross tons.

Hulls Nos. 1791-1795, five covered cargo barges for stock. 175' x 26' x 11'; 2650 gross tons.

Hull No. 1796, deck barge for Arundel Corp., Baltimore, Md. 110' x 34' x 11'3"; 334 gross tons.

Hulls Nos. 1797-1814, eighteen gate vessels for Bureau S. & A., Navy Dept., Washington, D. C. 5580 gross tons.

Hull No. 1815, one fabricated steel hull oil barge for Pacific D. D. & Repair, San Francisco, Calif. 195' x 35' x 9'9"; 598 gross tons.

ELECTRIC BOAT CO.
Groton, Conn.

New Construction:

Hull No. 38, Mackerel (SS204). Standard displacement 800 tons. Launched September 28, 1940.

Hull No. 39, Gar (SS206). Standard displacement 1475 tons. Launched November 7, 1940.

Hull No. 40, Grampus (SS207). Standard displacement 1475 tons. Launched, December 23, 1940.

Hull No. 41, Grayback (SS208). Standard displacement 1475 tons. Keel laid April 3, 1940.

Hull No. 42, Gato (SS212). Standard displacement 1500 tons. Keel laid October 5, 1940.

Hull No. 43, Greenling (SS213). Keel laid November 12, 1940.

Hull No. 44, Grouper (SS214). Keel laying date December 28, 1940.

Hulls Nos. 45 to 57 (SS215-SS221; SS253-SS258). Standard displacement 1500 tons.

Hulls Nos. 58-82. Standard displacement 1500 tons.

THE FEDERAL SHIPBUILDING AND DRY DOCK COMPANY
Kearny, N. J.

New Construction:

Hulls Nos. 122-127, six destroyers for U. S. Navy.

Hull No. 167, C-3 cargo vessel for U. S. Maritime Commission. Launched November 16, 1940.

Hulls Nos. 168-169, CL51, Atlanta; and CL52, Juneau; two 6000-ton cruisers for U. S. Navy. Keels laid April 22 and May 27, 1940.

Hulls Nos. 170, Edison; and 171, Ericsson; two torpedo boat destroyers for U. S. Navy. Launched November 23, 1940.

Hull No. 176, C-1 cargo vessel for U. S. Maritime Commission. Launching date, December 20, 1940.

Hulls Nos. 179-186, eight C-2 cargo ships for U. S. Maritime Commission. Keel laid, No. 179, December 27, 1940.

Hulls Nos. 187-188, two cargo vessels for Matson Navigation Co. Keels laid November 12 and 22, 1940.

Hull No. 189, one tanker for Pan American Petroleum and Transport Co. 13,000 dwt tons. **Launching date, January 31, 1941.**

Hulls Nos. 190-193, four tankers for Sinclair Refining Co. 15,000 dwt. Keel laid, No. 190, November 12, 1940.

Hulls Nos. 194-197, four destroyers for U. S. Navy. Keels laid, Nos. 194-195, December 2, 1940; Nos. 196-197, December 16, 1940.

Hulls Nos. 198-203, six destroyers for U. S. Navy.

Hulls Nos. 204-205, two destroyers for U. S. Navy.

Hulls Nos. 206-213, eight destroyers for U. S. Navy.

Hulls Nos. 214-218, five destroyers for U. S. Navy.

Hulls Nos. 219-221, three cruisers for U. S. Navy.

Hull No. 228, one C-2 cargo ship for U. S. Maritime Commission.

Hulls Nos. 229-230, two destroyers for U. S. Navy.

Hulls Nos. 231-232, two destroyers for U. S. Navy.

GULF SHIPBUILDING CORP.
Chickasaw, Ala.

New Construction:

Four 2100-ton destroyers for U. S. Navy.

Four vessels for Waterman Steamship Corporation. 445' x 63' x 40'6"; shelter deck type; geared turbine drive; 15½ knots service speed.

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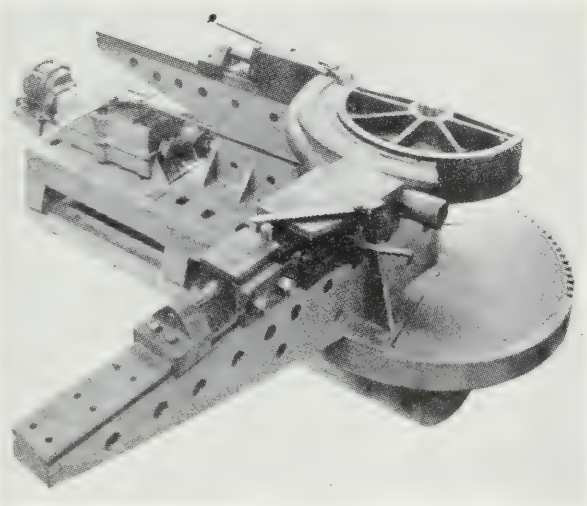

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GULFPORT BOILER & WELDING WORKS, INC.

Port Arthur, Texas

New Construction:

Hulls Nos. 167-168, two diesel-electric tugs for General Motors Corp. 100′ x 24′ x 12′4″; 1000 shp G. M. diesel and auxiliary each. Delivery dates, No. 167, March, 1941; No. 168, April, 1941.

Hull No. 176, diesel tug for General Motors Corp. 100′ x 24′ x 12′4″; 680 hp. Delivery date, July 30, 1941.

Hull No. 177, diesel tug for Deepwater Oil Terminals Co., Houston, Tex. 70′ x 18′ x 10′5″; 400 hp.

Hull No. 178, diesel tug for Butcher-Arthur Corp., Houston, Texas. 70′ x 18′ x 10′3″; 400 hp. **Delivery date, February 15, 1941.**

Hulls Nos. 181-184, four oil barges for Butcher-Arthur Corp., Houston, Texas. 150′ x 28′ x 8′.

Hulls Nos. 185-187, three oil barges for Butcher-Arthur Corp., Houston, Texas. 165′ x 36′ x 10′9″.

Hull No. 189, diesel tug for General Motors Corp., 100′ x 24′ x 12′4″; 680 hp. Delivery date, August 30, 1941.

THE INGALLS SHIPBUILDING CORP.

Pascagoula, Miss., and Decatur, Ala.

New Construction:

Hulls Nos. 254 to 256; three C-3 cargo vessels. Completion dates January, March and May, 1941.

Hulls Nos. 268, 297, 298, three C-3 IN passenger and cargo vessels for U. S. Lines.

One oil tanker for Husky Transit Corp., Minneapolis, Minn. 235′ x 35′ x 14′. **Completion date, January 3, 1941.**

Three steam turbine vessels for American-South African Lines. 492′ long, 69′6″ beam; 9500 shp; 18,000 ton dis.; 19 knots speed.

Hulls Nos. 265-267, three C-3-P cargo and passenger vessels for American-South African Lines. 492′ x 69′6″; 9500 shp; 18,000 tons dis.; 16½ knots speed. Completion dates November 15 and December 16, 1941; and January 15, 1942.

Hulls Nos. 283, 294-296, four C-3-S-A1 cargo vessels for U. S. Maritime Commission. Completion dates February 17, March 29, May 8 and June 17, 1942.

One oil barge for Goyer Oil Co., Greenville, Miss. 135′ x 33′ x 7′9″. **Completion date January 15, 1941.**

LEVINGSTON SHIPBUILDING CO.

Orange, Texas

New Construction:

Hull No. 155, tug for Higman Towing Co. 85′ x 24′ x 9′11″; 600-hp diesel.

Hull No. 160, tug for General Motors Corp. 85′ x 22′ x 9′; 800-hp diesel.

Hulls Nos. 186 and 190, two tugs for stock. 74′ x 20′ x 9′1½″; 400-hp diesel.

Hulls Nos. 187-188, two tugs for River Terminals Corp. 85′ x 23′ x 9′6″; 600-hp diesels.

Hulls Nos. 189 and 191, two 13,000-bbl oil barges for stock. 205′ x 40′ x 9′6″ x 10′10″.

Hulls Nos. 192-193, two 8,600 bbl oil barges for stock. 173′ x 39′ x 8′6″.

Hulls Nos. 194-195, two tugs for stock. 65′ x 17′ x 7′7″; 300-hp diesels.

Twenty-four 30-foot surf landing boats for U. S. Navy.

MANITOWOC SHIP BUILDING CO.

Manitowoc, Wis.

New Construction:

One steel twin-screw carferry. 406′ x 57′ x 23.5′. **Delivery date, January 4, 1941.**

JOHN H. MATHIS CO.

Camden, N. J.

New Construction:

Four anti-submarine net tenders for U. S. Navy.

One bulk carrier tanker 265′ long for Thos. Bowes, N. A.

NEWPORT NEWS SHIPBUILDING & DRYDOCK CO.

Newport News, Va.

New Construction:

Hull No. 372. Sold to U. S. Navy for conversion to naval auxiliary. Gross tonnage about 11,500 tons; LBP 525′, breadth molded 75′, depth molded 39′. Launched September 18, 1940.

Hull No. 378, battleship 58, Indiana, for U. S. Navy. Keel laid November 20, 1939.

Hulls Nos. 381-384, four single screw combination passenger and cargo vessels for U. S. Maritime Commission. 465′ x 69′6″ x 42′6″; gross tonnage about 9100 tons. Launching dates, No. 381, October 4, 1940; No. 382, November 20, 1940. **Delivery dates, No. 381, February, 1941;** No. 382, March, 1941; No. 383, April, 1941; No. 384, May, 1941.

Hull No. 385, aircraft carrier No. 8, Hornet, for U. S. Navy. Launched December 14, 1940.

Hull No. 386, single-screw combination passenger and cargo vessel for U. S. Maritime Commission. 465′ x 69′6″ x 42′6″; gross tonnage about 9100 tons. Delivery date May, 1941.

Hulls Nos. 387-388, two single-screw cargo vessels for Matson Navigation Co. 465′ x 69′6″ x 42′6″; gross tonnage about 7,700. Keel laid, No. 387, August 12, 1940. Delivery dates May 25 and July 1, 1941.

Hull No. 389, one single-screw cargo vessel for International Freighting Corp., Inc. 435′ x 63′ x 40′6″; gross tonnage about 8,000. Delivery date August 1, 1941.

Hulls Nos. 390-391 (CL62-CL63), two light cruisers for U. S. Navy.

Hulls Nos. 392-394 (CV9-CV11), three aircraft carriers for U. S. Navy.

Hulls Nos. 395-398 (CV12-CV15), four aircraft carriers for U. S. Navy.

Hulls Nos. 399-400 (CL80-CL81), two light cruisers for U. S. Navy.

THE NEW YORK SHIPBUILDING CORPORATION

Camden, N. J.

New Construction:

AV4, Curtiss, seaplane tender for U. S. Navy. Launched April 20, 1940.

AV5, Albemarle, seaplane tender for U. S. Navy. Keel laid June 12, 1939.

BB57, South Dakota, battleship for U. S. Navy. Keel laid July 5, 1939.

AR5, Vulcan, repair ship for U. S. Navy. Keel laid December 26, 1939.

CL55, Cleveland; and CL56, Columbia; two cruisers for U. S. Navy. Order placed March 23, 1940.

CL57 and CL58, two cruisers for U. S. Navy. Order placed June 12, 1940.

AV7, Currituck, seaplane tender for U. S. Navy.

CL59-CL61, three cruisers for U. S. Navy.

CB1-CB6, six cruisers for U. S. Navy.

CL76, four cruisers for U. S. Navy.

THE PUSEY & JONES CORP.

Wilmington, Del.

New Construction:

Hulls Nos. 1075 and 1076, two C-1 cargo vessels for U. S. Maritime Commission; 413′ x 60′ x 37′6″; 5000 gross tons; turbine propulsion; 4000 hp; 14 knots speed; cost $1,928,000. **Delivery dates January 15 and March, 1941.**

Hulls Nos. 1080-1081, two automobile and passenger ferries for Delaware-New Jersey Ferry Co. 206′ x 65′ x 16′; 750 gross tons; Una-Flow steam machinery; 1400 shp; 15 mph speed. **Launching date, February 1, 1941.**

SUN SHIPBUILDING AND DRY DOCK COMPANY

Chester, Pa.

New Construction:

Hulls No. 186, Rio Hudson; No. 187, Rio Parana; No. 188, Dio de la Plata; No. 189, Rio de Janeiro; four C-3 cargo and passenger liners for Moore-McCormack Lines. 492′ x 69′6″ x 42′6″; 8500 gross tons; diesel propelled; 8500 shp; 16½ knots. Delivery dates, August, September, October and November, 1941.

Hulls Nos. 199-206, eight C-2 cargo vessels for U. S. Maritime Commission. 474′ x 63′ x 40′6″: 7400 gross tons; diesel propelled; 7500 shp; 16 knots.

Hull No. 207, Esso Williamsburg, tanker for Panama Transport Co. 547′3″ x 70′ x 40′; 11,300 gross tons; diesel propelled; 7500 shp; 15 knots. Delivery date, April, 1941.

Hulls Nos. 208-210, three tankers for Petroleum Shipping Co. 520′ x 68′ x 37′; 10,400 gross tons; turbine; 4000 shp; 13 knots.

Hull No. 211, tanker for Atlantic Refining Co. 543′10″ x 70′ x 40′; 11,600 gross tons; turbo-electric; 5000 shp; 13 knots. Delivery date, April, 1941.

Hull No. 212, tanker for Sun Oil Co. 547′3″ x 70′ x 40′; 11,300 gross tons; diesel propelled; 7500 shp; 15 knots. Delivery date, March, 1941.

Hulls Nos. 213-216; 219-220, six tankers for Panama Transport Co. 547′3″ x 70′ x 40′; 11,400 gross tons; 7500 shp; 15 knots speed.

Hulls Nos. 217-218, two tankers for Standard Oil Co. of N. J. 547′3″ x 70′ x 40′; 11,400 gross tons; 7500 shp; 15 knots speed.

Hulls Nos. 221-222, two tankers for Keystone Tankship Corp. 520′ x 68′ x 37′; 10,600 gross tons; turbine; 12,000 shp; 16½ knots. Keel laying dates, November 15 and December 15, 1941. Launching dates, June 15 and July 15, 1942.

Hulls Nos. 223-225, three tankers for The Texas Co. 513′10″ x 68′ x 36′; 9300 gross tons; turbine; 9000 shp; 16 knots.

Hull No. 226, tanker for Kaymar Tankship Corp. 520′ x 68′ x 37′; 10,600 gross tons; turbine; 12,000 shp; 16½ knots. Keel laying date, April 5, 1942. Launching date, August 28, 1942. Delivery date, November, 1942.

Hulls Nos. 227-228, two tankers for Seamar Tankship Corp. 520′ x 68′ x 37′; 10,600 gross tons; turbine; 12,000 shp; 16½ knots. Keel laying dates, May 5 and June 5, 1942. Launching dates, September 28 and October 28, 1942. Delivery dates, December, 1942, and January, 1943.

Hull No. 229, tanker for Atlantic Refining Co. 543′10″ x 70′ x 40′; 11,600 gross tons; turbo-electric; 5000 shp; 13 knots.

Hull No. 230, tanker for Atlantic Refining Co. 474′ x 65′ x 37′; 8000 gross tons; turbo-electric; 5000 shp; 14½ knots.

Hulls Nos. 231-232, two tankers for Keystone Tankship Corp. 520′ x 68′ x 37′; 10,600 gross tons; turbine; 12,000 shp; 16½ knots.

Hull No. 234, tanker for Sun Oil Co. 547′3″ x 70′ x 40′; 11,400 gross tons; diesel propelled; 7500 shp; 15 knots.

Hull No. 235, tanker for Standard Oil Co. of N. J. 547'3" x 70' x 40'; 11,400 gross tons; turbine; 7500 shp; 15 knots.

Hull No. 236, tanker for Atlantic Refining Co. 543'10" x 70' x 40'; 11,600 gross tons; turbo-electric; 5000 shp; 13 knots.

TAMPA SHIPBUILDING CO.

Tampa, Fla.

New Construction:

Hulls Nos. 35-36, two C-2 type cargo vessels for U. S. Maritime Commission. 459' x 63' x 31'6"; 9291 dwt tons; diesel powered. **Delivery dates, No. 35, January, 1941;** No. 36, March, 1941.

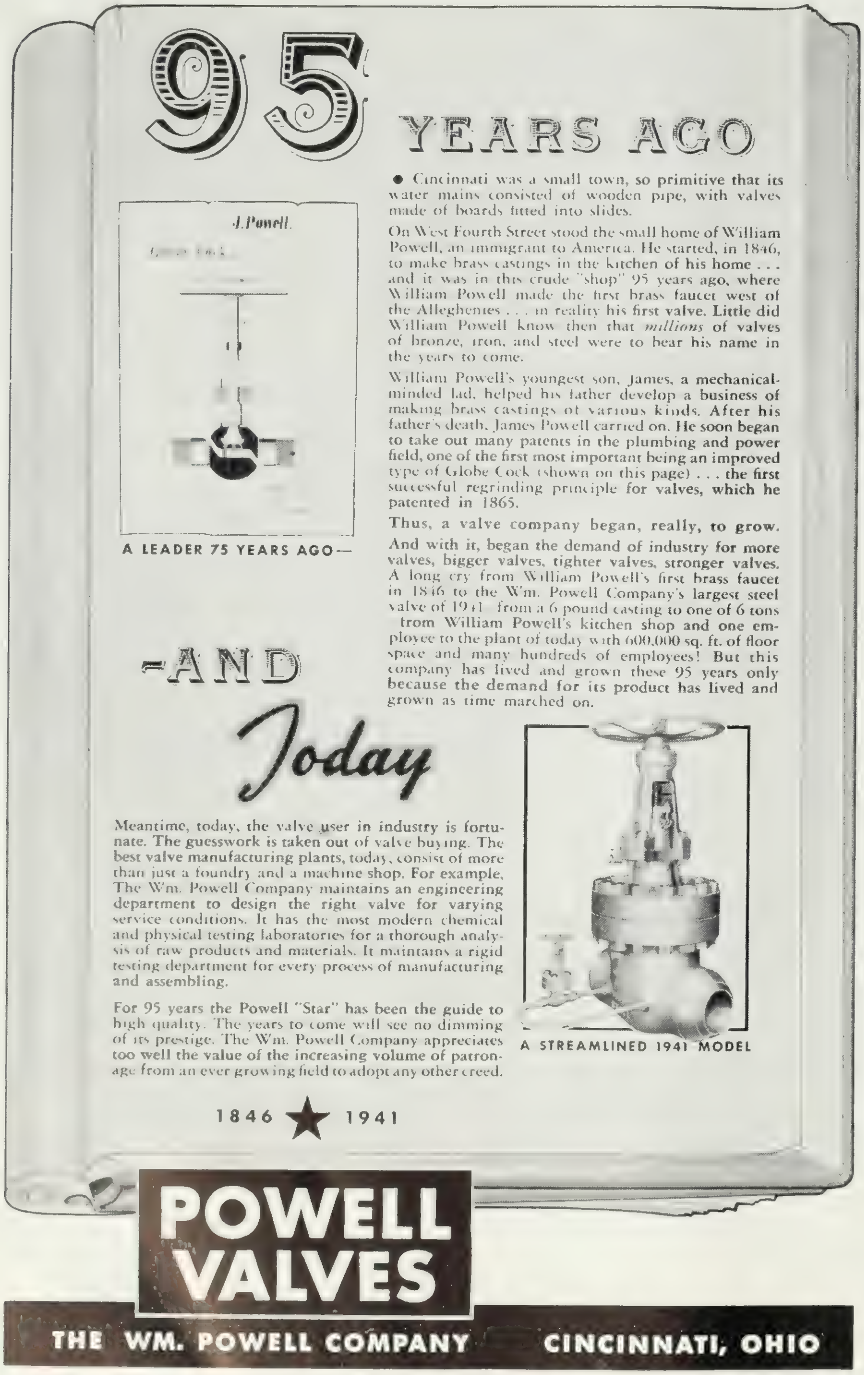
Hulls Nos. 37-40, four C-2 type cargo vessels for U. S. Maritime Commission. 459' x 63' x 31'6"; 9291 dwt tons.

TODD-BATH SHIPBUILDING CORP.

Bath, Maine.

New Construction:

Thirty cargo vessels for British Purchasing Commission. Cost $50,000,000.



95 YEARS AGO

● Cincinnati was a small town, so primitive that its water mains consisted of wooden pipe, with valves made of boards fitted into slides.

On West Fourth Street stood the small home of William Powell, an immigrant to America. He started, in 1846, to make brass castings in the kitchen of his home . . . and it was in this crude "shop" 95 years ago, where William Powell made the first brass faucet west of the Alleghenies . . . in reality his first valve. Little did William Powell know then that *millions* of valves of bronze, iron, and steel were to bear his name in the years to come.

William Powell's youngest son, James, a mechanical-minded lad, helped his father develop a business of making brass castings of various kinds. After his father's death, James Powell carried on. He soon began to take out many patents in the plumbing and power field, one of the first most important being an improved type of Globe Cock (shown on this page) . . . the first successful regrinding principle for valves, which he patented in 1865.

A LEADER 75 YEARS AGO—

Thus, a valve company began, really, to grow.

And with it, began the demand of industry for more valves, bigger valves, tighter valves, stronger valves. A long cry from William Powell's first brass faucet in 1846 to the Wm. Powell Company's largest steel valve of 1941 from a 6 pound casting to one of 6 tons from William Powell's kitchen shop and one employee to the plant of today with 600,000 sq. ft. of floor space and many hundreds of employees! But this company has lived and grown these 95 years only because the demand for its product has lived and grown as time marched on.

—AND Today

Meantime, today, the valve user in industry is fortunate. The guesswork is taken out of valve buying. The best valve manufacturing plants, today, consist of more than just a foundry and a machine shop. For example, The Wm. Powell Company maintains an engineering department to design the right valve for varying service conditions. It has the most modern chemical and physical testing laboratories for a thorough analysis of raw products and materials. It maintains a rigid testing department for every process of manufacturing and assembling.

For 95 years the Powell "Star" has been the guide to high quality. The years to come will see no dimming of its prestige. The Wm. Powell Company appreciates too well the value of the increasing volume of patronage from an ever growing field to adopt any other creed.

A STREAMLINED 1941 MODEL

1846 ★ 1941

POWELL VALVES

THE WM. POWELL COMPANY CINCINNATI, OHIO

A New Design In Printing Machines

New simplicity of design and new operating usefulness are embodied in a new blue printer just announced by Charles Bruning Company, Inc. Known as the Model "55" BW Printer, this machine is said to be the most compact printer of its capacity on the market. It measures only 32 inches wide, 62 inches long and 48 inches high.

The Model "55," a 42-inch printer, operates with either cut sheets or roll stock. It prints ink tracings at from 12 to 15 feet per minute. A full-view speed indicator placed at the center of the front, above the feed board, makes the speed of the machine readily visible to the operator at all times.

An exclusive feature of the Model "55" Printer is its new print and tracing return. The entire top of the machine serves as a return tray, and the return is so designed that the tracing enters the tray on top of the print—in exactly the same way as it is inserted in the machine. No reversing of the tracing is necessary when reinserting it into the machine. Furthermore, as they emerge from the printer onto the tray, exposed sheets stack themselves almost automatically.

The light source of the new Model "55" Printer is a 55-watt new-type mercury vapor quartz lamp. This quartz lamp furnishes uniform exposure without flickering, and is guaranteed for a life of 1000 hours. The lamp is installed in a revolving 9-inch Pyrex contact cylinder, which provides almost perfect contact.

The Model "55" Printer is equipped with a double centrifugal blower to reduce operating noise. In addition, the transmission and motor are resiliently mounted to reduce vibration. An automatic clutch, operated by a simple, wide-range foot pedal, releases the feed roller so the tracing may be adjusted or removed when necessary.

A hinged section at each end of the printer allows ready access to all electrical controls and drive mechanism for cleaning and servicing. An automatic switch shuts off the light when the end housing of the tube and cylinder are removed.

The "55" Printer is made for two currents—220 volts a. c. 60 cycles, or 220 volts a. c. 50 cycles. Operating electrical requirement for the entire machine is only 3800 watts.

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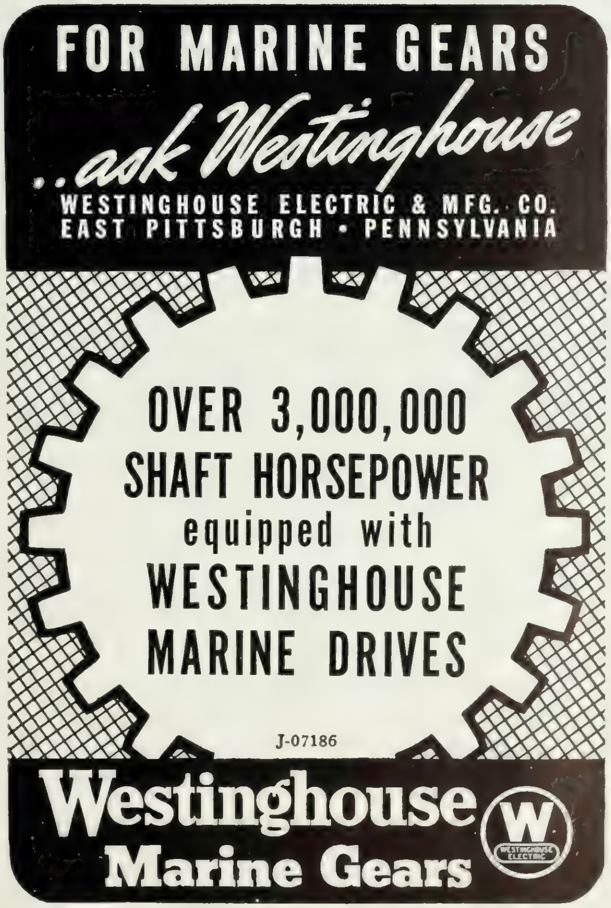

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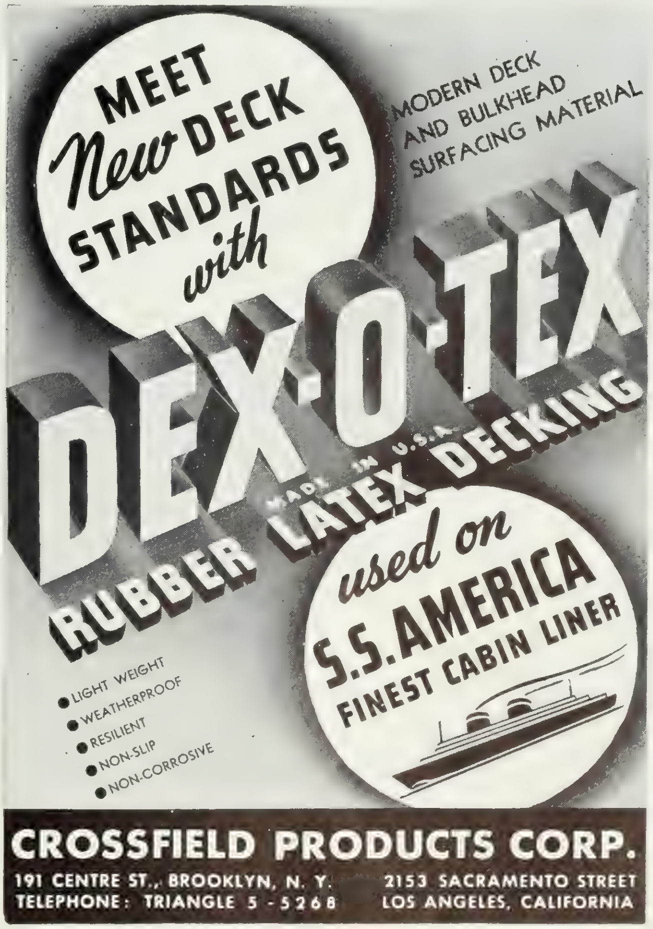

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"Blue Streak" Goes Streamlined

On January 2 the engineers of The Yale & Towne Mfg. Co. announced a streamlined version of the single-stroke "Blue Streak" hand lift truck for handling 2500-lb. loads.

Improvements were made not only with an eye to appearance, but also to greater safety, lower maintenance and higher efficiency. Among the "Blue Streak" features are the following:

A new type balanced tubular handle, with comfortable fitting hand grip and with tubular shaft and lower handle casting welded into a single unit, preventing parts from working loose. The handle balancing mechanism, which keeps handle in an upright position, prevents tripping and relieves operator of handle weight, is completely enclosed in the handle to protect it from outside shock.

A new counterbalanced load retaining hook, which eliminates the necessity for springs, grips a roller latch, holding the load in positive lock while elevated. The roller latch, in addition to eliminating wear, also permits trigger action release of the load.

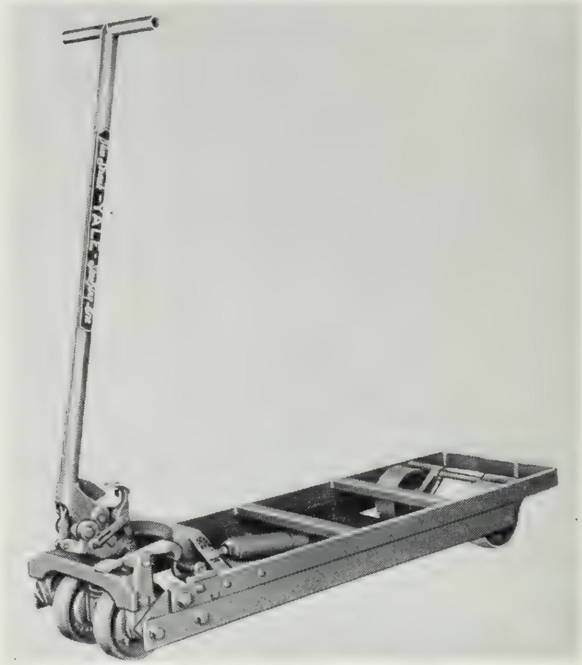
Another new "Blue Streak" feature is the shorter handle stroke, which requires less bending effort by the operator. The lift hook has been improved. Self-locking, it requires only the slightest pressure on the treadle to positively engage the lifting frame. When the load is fully lifted, it automatically disengages, providing a free handle and preventing "flying handle."

Loads may be elevated with the handle at any point within a 90-degree arc. Steering may be accomplished around the sharpest turns, since the new "Blue Streak" features full 180-degree steer.

The massive front head assembly has been improved. The steering column now operates inside a special steel bushing and a hardened steel washer has been inserted between the head casting and the wheel fork to minimize friction and give easier steering.

The "Blue Streak" still retains its compound (articulating) lifting mechanism, which changes the lifting ratio, flattens out the lift curve and reduces lifting effort. Also retained are the keyed, high-carbon, chrome-manganese, hardened steel axles; the hydraulic release check, which cushions descending loads; the welded, single-unit load frame with rounded safety corners; and the heavy-duty machine-turned wheels mounted on Hyatt roller bearings.

The truck is made in two models—wide and narrow frames—each with capacity of 2500 lbs.



The new streamlined "Blue Streak" Yale hand lift truck

Trade Literature

Top Notch Shock-Resisting Tool Steel, a new six-page folder just published by Jessop Steel Co. This folder is of special interest to makers and users of chisels and pneumatic tools, as well as other tools and dies for cold work or semi-hot work applications where resistance to severe and repeated impact is important. Contains complete information on the heat-treatment of Top Notch. Copies will be sent free upon request.

◆

Arc Welding for Building Construction. This 16-page folder, recently published by Air Reduction, New York, will be of great interest to all structural steel men, both from a design and construction standpoint. Owners, architects, engineers, fabricators and contractors will find an interesting review of how welding decreases the weight and cost of structural steel . . . how it saves material in structural connections . . . provides greater freedom in architectural and structural design . . . eliminates the cost of punching and drilling holes, reduces handling of heavy pieces in the shop . . . eliminates noise which is disagreeable to occupants of nearby buildings and confusing to workers in shop and field . . . facilitates remodeling and making offices with minimum removal of existing walls and floors . . . reduces corrosion and cost of painting and maintenace of exposed steel.

These various advantages of welding are illustrated specifically in a four-page article reprint featuring the construction of the Airlines Terminals Building in New York City.

Designers will be particularly interested in two pages of fundamentals of design for welded construction. This section will aid in application of specific jobs on hand.

Copies of this bulletin may be obtained on request.

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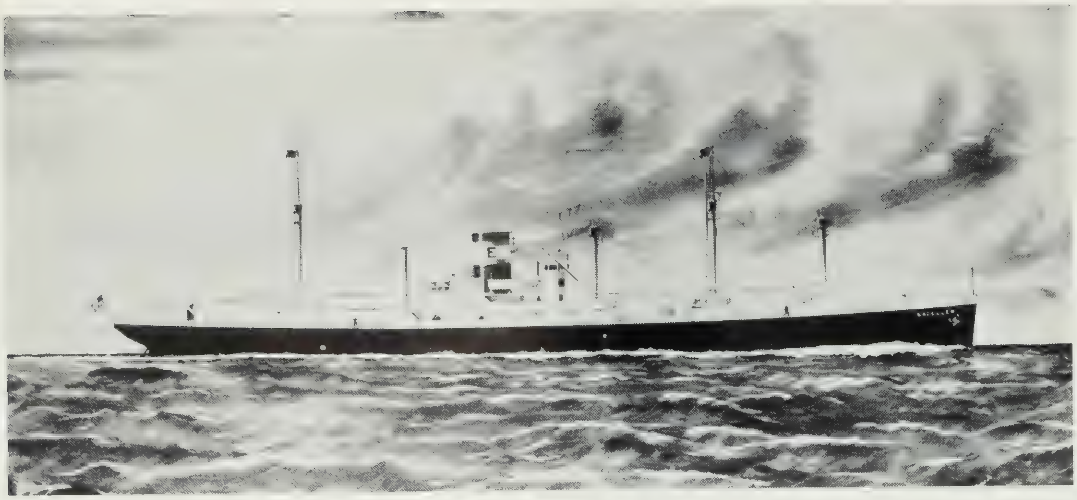

Artist's conception of the new type Exporter steamers, four of which are building at Bath Iron Works

New Type Exporter Steamers

Bath Iron Works Well Ahead of Schedule

Construction on two of the four vessels being built for American Export Lines at the Bath Iron Works yards at Bath, Maine, is more than six weeks ahead of schedule, according to L. S. Andrews, operating manager of American Export.

These vessels, to be christened the Exceller and the Extavia, will probably be ready for launching in May and June, 1941. All necessary materials were purchased before defense demands became acute, and Government orders have resulted in expansion of the shipyard's capacity for production.

Keels for two additional vessels of the same type will be laid as soon as the pair now under construction are launched.

These four ships, costing approximately $2,200,000 apiece and designed by American Export Lines under Mr. Andrews' supervision, are intended ultimately for the Spanish, North African and Black Sea trade. Because of local peculiarities at certain ports of call, such as the 50-mile run up the Guadalquivir River to Seville, Spain, vessels somewhat shorter than the "Exporters" were needed. Certain specifications, however, such as horsepower, loaded draft, steam pressure and temperature were kept the same. They will have a speed of 16½ to 19½ knots fully loaded, a higher speed than any comparable type of ship.

A comparison of the specifications follows:

Original Exporter

Length overall	475 feet
Beam	66 feet
Draft, fully loaded	27 feet
Cruising radius	15,000 nautical miles
Capacity	535,000 cubic feet
Horsepower	8,000
Steam pressure	475 pounds
Temperature	740 degrees
Cargo holds	7
Crew	43

Modified Exporter

Length overall	420 feet
Beam	60 feet
Draft, fully loaded	27 feet
Cruising radius	13,000 nautical miles
Capacity	400,000 cubic feet
Horsepower	8,000
Steam pressure	475 pounds
Temperature	740 degrees
Cargo holds	5
Crew	38 (probable)

In other details, such as engines, boilers, modern crew quarters, electric winches, Cargocaire, cargo oil and tanks, the modified Exporters' equipment will be identical with that of the standard Exporters.

American Export recently launched the eighth of its Exporter ships, the Examiner, at Quincy, Massachusetts. This will soon join its sister ships in the company's New York to India service via Cape of Good Hope.

New High-Test Flux-Coated Bronze Welding Rods

An outstanding new high-test flux-coated bronze welding rod has recently been announced by Air Reduction, New York. It offers eight outstanding advantages for bronze welding operations:

1. Low fuming
2. Applies faster
3. Denser deposit
4. Increased tensile strength
5. Greater bond strength
6. Increased hardness of deposit
7. Materially improved ductility
8. Time saving.

Each of these qualities is an advantage that every experienced buyer will appreciate. Time formerly lost in removing a bare rod from the molten puddle and dipping it into a flux can is time saved when Airco high-test flux-coated bronze welding rods are used. The flux adheres very well in shipment and in use. It will not fall off when the rod is excessively bent.

For those who prefer a bare welding rod, the same outstanding flux is available in a liquid paste form.

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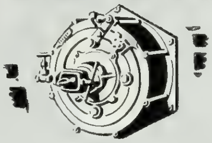

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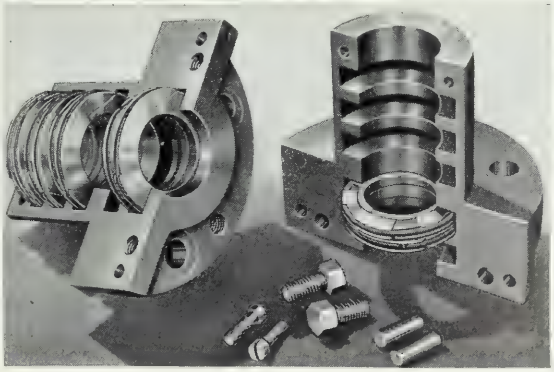

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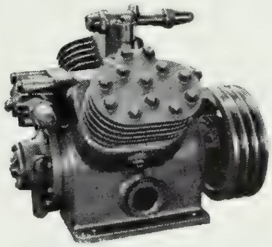

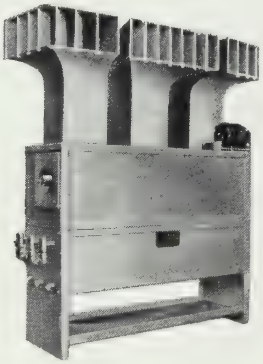

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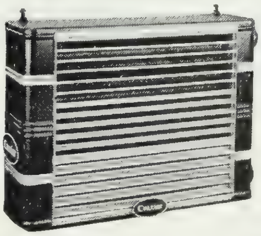

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General Electric In The Marine Field, 1940

by **D. W. Niven**

Manager, Federal and Marine Department, General Electric Company

The rapid acceleration of production to meet the demands of the greatest marine expansion in the history of the country may well be cited as the outstanding development of the year, from the standpoint of marine apparatus manufacturers. When unprecedented orders confronted the industry with new production problems, immediate steps were taken to solve them. Plants were expanded, training programs enlarged and other plans to gear production to the nation's needs were put into effect.

Since the manufacture of turbines and turbine reduction gears for marine use could be speeded up to an appreciable extent only by means of increased capacity, General Electric undertook a substantial expansion in its turbine shops and plant equipment. Mass-production methods could not be adopted in the manufacture of these equipments, as each unit required engineering in detail, and because of their size and rigid performance specifications, months are required to build, test and install them. For example, at the G-E Lynn Works, reduction gears up to 17 feet in diameter, weighing as much as 100,000 pounds, and machined to tolerances measured in ten-thousandths of an inch, are subjected to painstaking procedure requiring a minimum of ten months to complete.

During 1940 millions of horsepower in turbine propulsion units was ordered, with turbine-geared sets being the type most universally specified. Into service went the de luxe passenger-cargo vessels Delbrasil, Delorleans and Deltargentino, built by Bethlehem for the Mississippi Shipping Co., with three more vessels of the same type scheduled for completion in 1941. Plying between New Orleans and the East Coast of South America, with a saving of five days in operating time from New Orleans to Buenos Aires, these vessels are propelled by geared turbines rated 7800 hp at 105 rpm. of the propeller shaft.

The first two Ingalls Shipbuilding Corp. C-3 vessels (Maritime Commission cargo vessels) completed their trials and went into service during the year; one of these has now been taken over by the Navy for auxiliary purposes. Propulsion for these two vessels consists of turbine-gear equipments, developing 8500 hp with steam conditions of 440 lb. pressure and a temperature of 740 F. Several other C-3 vessels now under way at the Ingalls yards will be propelled by similar equipment. The performance of the C-3 ships built at Ingalls, according to all reports, has been very successful and with good overall fuel economy figures.

Two more train-carrying vessels, the Seatrain Texas and the Seatrain New Jersey, were added to the fleet operated between United States and Cuban ports by the Seatrain Lines, Inc. Laid down in the yards of the Sun Shipbuilding and Dry Dock Co., the latest Seatrains are propelled by 8000-hp, cross-compound, double-reduction turbine-gear sets.

Contracts for the first large diesel-engined vessels to be built on the West Coast since the World War were placed with the Western Pipe & Steel Co. of San Francisco for five ships, and with the Seattle-Tacoma Shipbuilding Corp. of Seattle for five ships. All auxiliary electric equipment for these ten new ships was furnished.

High-speed geared-turbine tankers were ordered by many oil companies. Turbine-electric propulsion equipments were under way for the fifth, sixth and seventh new tankers for the Atlantic Refining Co., duplicating the successful high-pressure, high-temperature installations of the S.S. E. J. Henry and S.S. R. C. Tuttle, put into service in 1939 and 1940, respectively. The main propulsion turbine of these installations was designed to operate with steam at 600 lbs., 900 deg. F.

Nineteen-forty saw a remarkable increase in orders placed for diesel-electric vessels. The Navy put into service the world's largest diesel-electric tugboats ever built—the tugs Navajo, Seminole and Cherokee. In these vessels the propelling motors were geared to the propeller shaft, thus reducing the overall weight materially. A 600-kilowatt generator was direct-connected to each of four main diesel-engines totaling 3800 hp per vessel. During the year, equipment for remote control from the pilot house was simplified, leading to a reduction in the size of the equipment with a substantial decrease in its weight.

Auxiliary Marine Turbines

Activity in the small turbine field during 1940 centered particularly in units for generator drive aboard ship. Considerable work was done on the simplification and standardization of units for such service. Of particular interest were specially-designed units with dual-pressure inlet for driving 350-kw generators for auxiliary power and lighting on merchant ships. The turbine operates on either cross-over steam pressure of the main propulsion cross-compound units at approximately 200 lbs. G; or, in case of steam shortage in the cross-over connection, the turbine control automatically transfers to a second inlet taking steam directly from the main boilers at the steam conditions for the propulsion high-pressure turbine. Transfer from low- to high-pressure steam is automatic, but hand-resetting is required to transfer from high- to low-pressure steam, thus eliminating any rapid transferring from one steam inlet to the other during ship maneuvers.

Motors and Control for Auxiliaries

The unusually large merchant shipbuilding program enabled standardiza-

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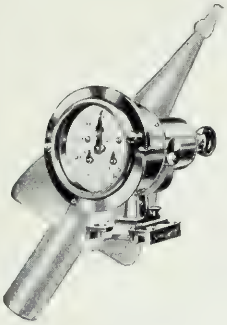

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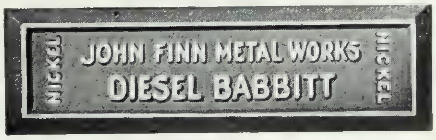

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tion to a large extent of the main items going into the production of motors and control for auxiliaries. The direct current line of motors for driving underdeck auxiliaries was developed to the point where standard industrial motors could be applied to marine work with a minimum of change, resulting in benefits for both marine and industrial users.

Control equipment for underdeck motors was also standardized to a large extent, and the individual panels were mounted in uniform standardized cubicles bolted together in a complete group structure. This standardization made possible the future addition of cubicles alongside of original groups by making simple changes while maintaining uniform appearance. With this form of structure, all the control can be assembled in one unit readily accessible for operation and maintenance.

The Maritime Commission rendered great assistance in the standardization of designs for deck machinery equipment. A large number of improvements and coordination of designs were part of the standardization program, which, when completed in 1941, will assist greatly in speeding up this phase of the shipbuilding program.

Alternating Current

In a number of merchant vessels, alternating current was adopted for electrical auxiliaries. While a few vessels have been so equipped in the past, and while the United States Navy has adopted a-c almost entirely for the past two years, the increase in its use may be taken as an indication of future development. In this connection, considerable study was given in 1940 to the problems of applying alternating current for the power plant and auxiliaries of the proposed Maritime Commission P-4-P passenger vessel.

Welding

A steady increase in the use of arc welding in the marine field during the year helped to speed up production, making possible more efficient and more economical hull structures. All shipbuilding yards in this country have accepted welding for a substantial portion of their fabrication work, and at least seven yards have been building large all-welded merchant vessels.

Arc-welding equipment of the constant-potential, multiple-operator type and the single-operator type were those most universally used in the marine field. During the year, the constant-potential, multiple-operator set was redesigned, as was the AW resistor used with it. The new design improved portability, making the set more adaptable for installation on ways or aboard ship.

The use of welding for maintenance work both in shipyards and aboard ship came into wider use. Complete arc welding set installations aboard naval vessels permitted many vital repairs otherwise possible only in port.

Heavily coated electrodes were used almost without exception, and the trend for all work was toward larger electrodes and heavier currents.

New Metal Hardener Important In Marine Equipment

As a result of the shortage of tin in World War I, the desirability of lighter and stronger metal for casting, and the persistence of a young Scotch engineer, a new metal hardener was developed, which today plays an important part in national defense. It likewise has provided industry in general with a valuable element applicable to many phases of metal fabrication for countless domestic products.

A combination of silicon, copper and iron alloyed together, produced a metal known as "P-M-G," and its manufacture in the United States and Canada is controlled by the Phelps-Dodge Copper Products Corporation, with the Canadian license being held by the Canadian Bronze Company. The metal is of lower specific gravity than the conventional tin bronzes, is of greater strength, has greater resistance to fatigue and shock, and is particularly adaptable to conditions where sea water corrosion or the effect of elements is a factor. Because of this, it is highly valuable in naval construction, and will play an important part in the naval rearmament program now in progress in the United States.

The vitally important and effective substitute for tin in the fabrication of many articles that go to make up the modern naval vessel will alleviate considerably the present concern over the tin shortage in the manufacture of the articles in which it replaces that metal. In the construction of each of the two palatial liners Monarch of Bermuda, and the sister ship, Queen of Bermuda, virtually all the bronze castings were of "P-M-G" metal, and a far greater amount goes into the average Navy dreadnaught, where the new hardener can effect a large reduction in the weight of castings, shafting, shell-hoists, torpedo tubes, and miscellaneous tubing and other metal parts of the vessels.

The discovery of the new metal was the result of constant study and research from the latter part of the first World War until 1926, when the work of William B. O'Brien Goudielock, Vickers-Armstrongs' chief metallurgist, bore fruit.

When the 1922 Washington Disarmament Conference placed restrictions on the tonnage and size of naval vessels, the discovery of "P-M-G" became of even greater importance, for by eliminating much weight in the construction of parts for vessels, either greater speed or increased armament was permissible. The British Admiralty followed closely the work of the young engineer and metallurgist, and quickly made use of the new metal in its ships.

It was found also that the new metal produced with the hardener had the additional advantage of coming out of casting with a clean surface, and it is available for fabrication by either the wrought or cast methods of production.

Shortly after the conclusion of Goudielock's successful experiments he came to the United States. Here his discovery came to the attention of Wylie Brown, president of Phelps-Dodge Copper Products Corporation, and his associate engineers. With vision which included the broad application of the discovery, the American company arranged for the exclusive licenses in the United States and Canada. Today this foresight of Wylie Brown and his company looms as intensely important to the naval reconstruction program of the United States.

The United States Government, after seeing tests of the new hardener, approved it for various phases of naval construction, and today it will play an important part in the Navy's new building program. Not only in the naval service, but in the army ordnance departments, "P-M-G" is being used for fire control instruments, sighting equipment, brack-

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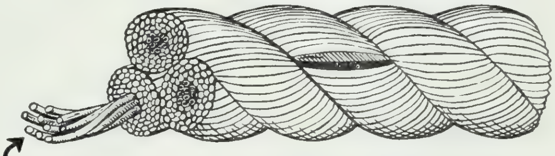

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ets, fittings, shell-hoists on big guns, bushings, bearings, rods, bolts, gears, housings and shaftings. Because of the great strength and light weight of "P-M-G," parts can be cast with thinner wall sections, where weight is an important factor.

Use of the "P-M-G" in American industry found wide diversification. The oil, paper, coal and other industries use the metal for valves, couplings, elbows, T's, shafting for pumps, safety hooks on buildings (for window cleaning workers), conduits in tunnels and river bridges, domestic water heaters and household supplies—in fact, wherever metal products are subjected to corrosion due to dampness or the elements. Space-saving, weight-saving, stronger than ordinary metals formerly used for these purposes, "P-M-G" is playing its part both in industry and national defense.

FM Goes to Sea

Broadcasters, public utilities, police, Civil Aeronautics Authority—all have found improved radio service with frequency modulation. Now comes the sea. At Boston Harbor, both quarantine officials and shipowners are happier because of recently-installed General Electric FM radio equipment for two-way communication between United States quarantine tugs and the Quarantine Administrative Headquarters at Custom House, Boston, Massachusetts.

The quarantine tugs go out five miles each day to subject all vessels entering the port of Boston to inspection. Since the FM equipment provides noise-free, reliable communication between quarantine tugs and Custom House, the necessity of returning to shore to check records is eliminated. Quarantine officials are thus able to clear more ships in busy times. Shipowners are saved time and money, as they know exactly when to expect their boats to dock—a very important factor in hiring longshoremen for unloading purposes.

Previously, with the docking time uncertain, it was sometimes necessary to hire longshoremen for long standby periods so they would be on hand when needed. At times vessels had been delayed as long as two days because longshoremen could not be hired before a certain deadline.

Shipping and Port Activities Notes The American Merchant Marine Conference

Wanted: an American Shipping Film.—At the New Orleans National Convention of Propeller Clubs and American Merchant Marine Conference, many ideas were advanced for producing shipmindedness among the American people. Among them was a publicity program proposed in the Report of the Committee on Public Education, which envisions a color-sound film produced by the American shipping industry and made available to schools all over the country.

Such a film could bring to the great mass of people living in the interior a comprehension of the problems facing the American shipowner, and would open their eyes and their minds to the value of American ships in the distribution of their products. This committee suggested also that every port of the Propeller Club should set up active committees on Public Education, and that the national body of Propeller Clubs should create a permanent committee to direct this work and coordinate its activities.

These suggestions all have our hearty endorsement. A film, "Men and Ships," prepared by the U. S. Maritime Commission, is now in national theatrical circulation. This film is designed to focus attention on the U. S. M. C. training program. It was photographed at the training stations and at sea on the training ships. It is accompanied by music and explanatory narration. Several private steamship companies have produced films covering their own services. However, a comprehensive film showing the need for an American Merchant Marine would be a very valuable contribution to merchant marine publicity.

Adopt a Ship Plan—Mrs. Arthur Tode, reporting for the Women's Organization for the American Merchant Marine, stated that their "Adopt a Ship" plan is working nicely. It raises great interest not only on the part of the children in the school or class which adopts a ship, but on the part of their parents and all their friends. There is also a very valuable effect on the officers and personnel of the ship adopted. Many of these men say this contract has renewed their faith in American youth.

Books for Seamen—Leonard Sullivan, executive secretary, American Merchant Marine Library Association, reported that he found increasing interest. During 1940 they had received 90,000 books and 292,000 magazines, and had 980 new donors of books. They had contributions from 53 lines, totaling $16,057, and served 1352 ships circulating 174,750 (10 months) books and a similar number of magazines. In addition to this work, the Association served 206 lighthouses and Coast Guard stations with 312 libraries containing 11,505 books.

New Synthetic Rubber and Koroseal Packings

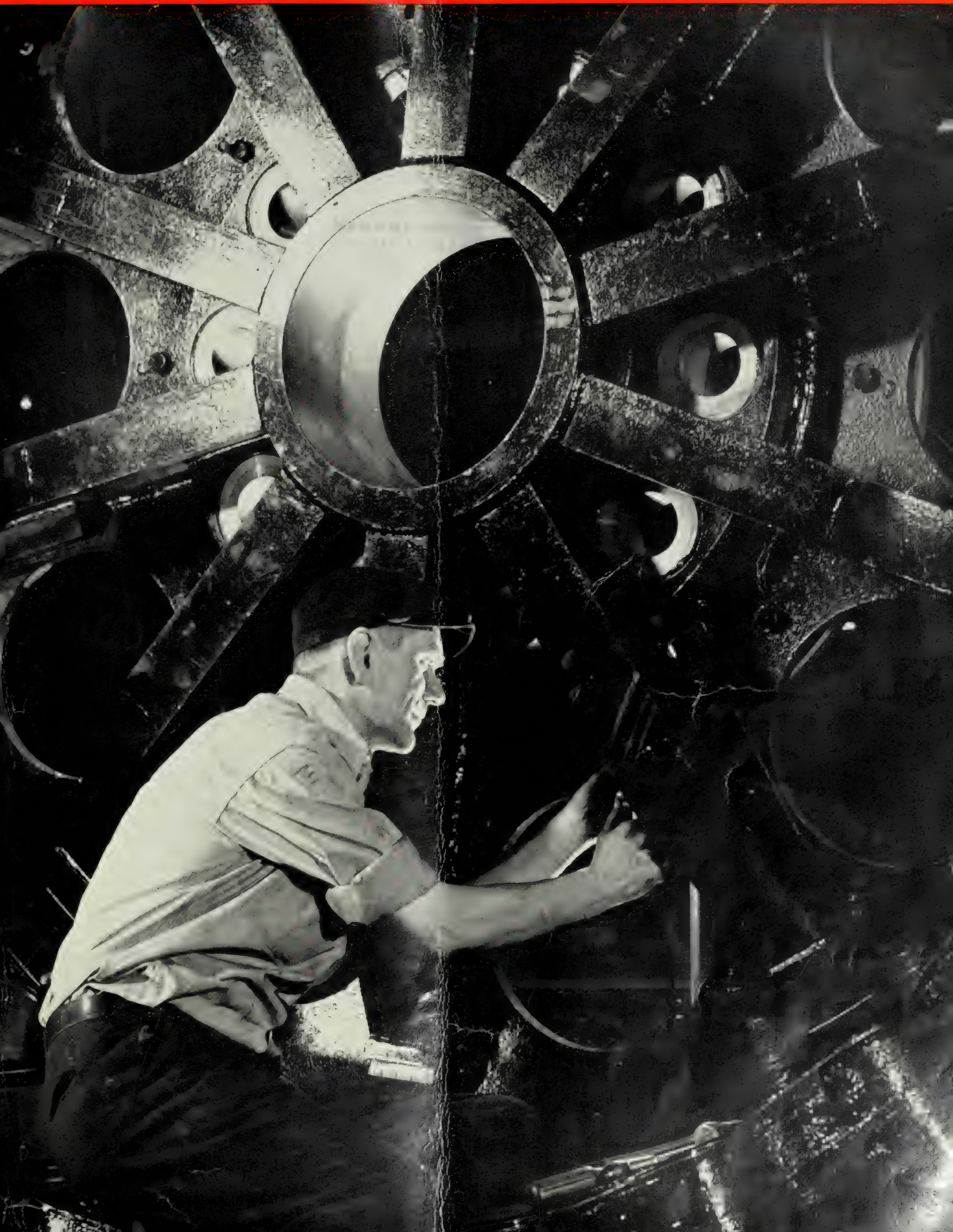
Two new types of packing, one made of Ameripol, its own synthetic rubber developed after 14 years of research, and revealed last summer; and the other of Koroseal, the synthetic elastic material also created in its laboratories; are announced by The B. F Goodrich Company, Akron, Ohio. Both are sheet packing.

The Ameripol product is a dark sheet packing superior to natural rubber and other synthetic packings in its resistance to the action of oils. It ages well, and provides excellent resistance to heat and cold as well as water absorption. Tensile strength is approximately 1,500 pounds per square inch, elongation 400 per cent, Shore durometer hardness 78 to 82.

Made to order only in 100-pound rolls, approximately 36 inches wide in thicknesses from $\frac{1}{32}$- to $\frac{1}{4}$-inch inclusive, a square yard of the $\frac{1}{16}$-inch size weighs approximately $4\frac{3}{4}$ pounds.

The Koroseal packing is specially compounded to resist the action of oils and solvents, and also resists the action of some corrosives. Tensile strength is about 2,200 pounds per square inch, elongation 300 per cent, Shore durometer hardness 73 to 77. It is furnished in 26- by 26-inch sheets, with the $\frac{1}{32}$, $\frac{1}{16}$, $\frac{1}{8}$ and $\frac{3}{16}$ inch sheets carried in stock, and other thicknesses made to order.

PACIFIC MARINE REVIEW



On the Job with America's Defense

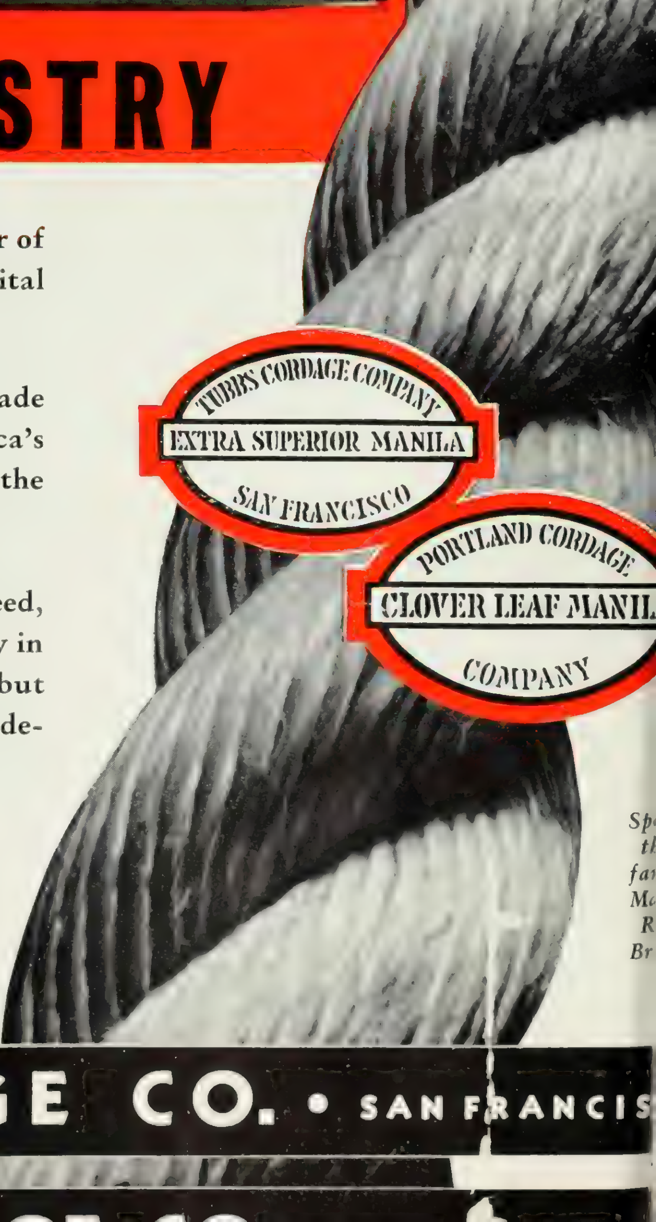
AVIATION INDUSTRY

In the aviation industry, perhaps more than in any other of Uncle Sam's first lines of defense, precision is a most vital factor.

It is for this reason that Tubbs and Portland precision-made ropes have been selected time and time again by America's leading aircraft manufacturers to play their part on the production line.

Tubbs and Portland Cordage Companies are proud, indeed, of the important part they have been called upon to play in America's defense—not alone in the aviation industry, but in all the other industries that have responded to the defense call.

When America's merchant marine specifies Tubbs and Portland rope brands, they are assured of this same dependability that has won for these products such an important place in defense industries.



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Official Organ

Pacific American
Steamship Association

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Shipowners Association
of the Pacific Coast

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PACIFIC MARINE REVIEW

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Our Cover

The illustration on the cover depicts a massive steel spider, a part of one of the 22 Westinghouse electric couplings that will drive 11 United States Merchant Marine cargo ships now under construction. Four vessels already have been outfitted with this new development that "cushions" reduction gears against the pulsations of power diesel engines. The quarter-inch gap of air separating this 12½-ton unit from a smaller wheel will be the only connection between the engine and propeller in the new ships. The interaction of magnetic forces set up by electrical energy in the gap between the two wheels causes the propeller-connected outer wheel to revolve with the inner wheel which is coupled to the engine. Practically none of the pulsations produced by the internal combustion engine will reach the gears.

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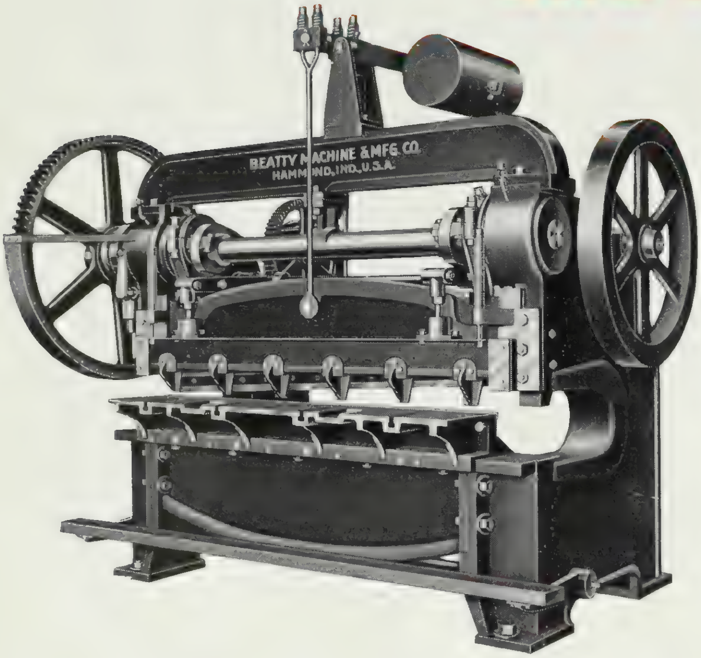
BEATTY

Modernized Power Punches and Shears



Illustrated: No. 27 Plate Shear. Beatty plate shears are built in various sizes from ¼-inch to 1¼-inch plate—and in any length up to 12 feet.

The "Beatty Line" comprises as many different types of machines as there are punch and shear requirements.

For over a quarter of a century BEATTY EQUIPMENT has been earning the acceptance and endorsement of the leaders in industry.

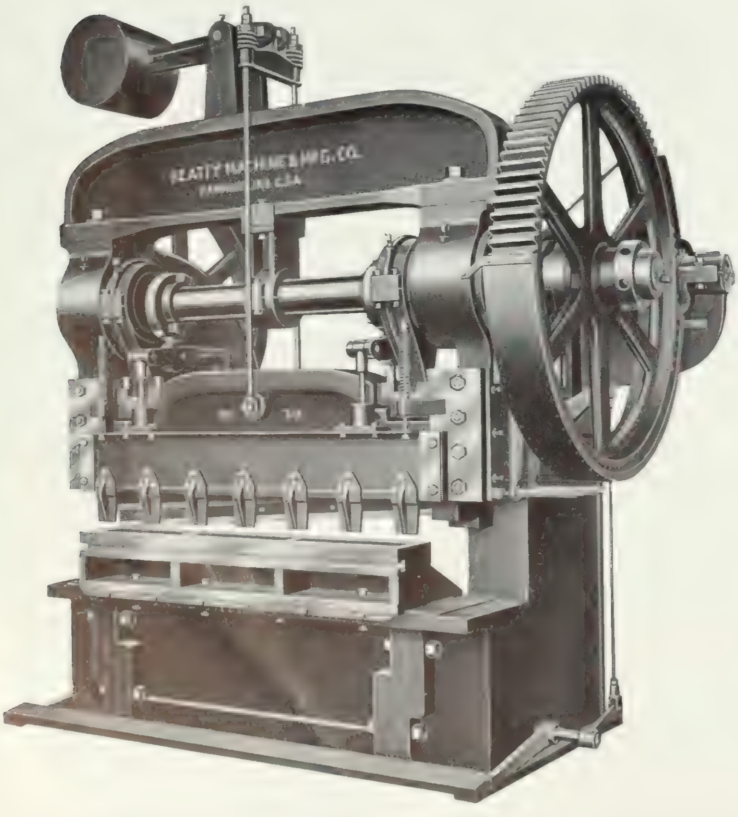
Realizing the need, created by the huge shipbuilding program, for modernized power shears and punches which will turn out rapid and accurate production work on steel shapes and pressed steel parts, Beatty Products are now being made available for Pacific Coast yards.

To meet your urgent requirements, we offer a complete line of punching and shearing equipment with superior construction advantages which will satisfy the most exacting buyer who requires machines that will stand up for years with minimum attention.

BEATTY EQUIPMENT eliminates unnecessary handling through combination set ups, and large die space, thereby increasing production and reducing costs.

Our message to Pacific shipbuilders and allied industries:

"We are ready to help. Let
Beatty solve your problem!"



No. 30 Plate Shear. Note distance between housings; throat depth in

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1941

Pacific Coast Growth in Shipbuilding Capacity

On January 1, 1939, the capacity of the Pacific Coast in commercial shipbuilding ways ready for keel laying of large steel seagoing vessels (2000 gross tons or over) was approximately eight. More accurately, it would be seven and a half. One of these was located on Lake Washington adjoining Seattle, six were on San Francisco Bay and one and a half in Los Angeles.

Today there are in use or under construction or contract to build: 20 ways in the Puget Sound section; 12 at Portland, Oregon; 26 on San Francisco Bay; and 18 at Los Angeles. This makes a total of 76 shipbuilding ways without including Navy yards, or an increase of 900 per cent in two years.

Some of these ways, of course, are simply erection ways for the standardized vessels of the emergency merchant shipbuilding program, both Maritime Commission and British, and for the two-ocean Navy ships. However, no one will venture a prediction on the "duration," and it is certain that while the war continues, and for some time after it is over, there will be a great demand for merchant ships.

Pacific Coast shipbuilders have orders on hand to fill these ways for at least three years, and there is much more shipbuilding on the way, both from Government and from private sources.

These ships under construction will need much equipment, machinery, furnishings and materials. The products of many Pacific Coast industries fit into this picture. All of the Eastern and Middle Western plants producing these items are glutted with work now. The opportunity for aggressive Pacific Coast manufacturers is tremendous.

Some of the items required in huge quantities are:

Paint and varnish for exterior and interior finishes suitable for salt water exposure, anti-fouling and anti-corrosive paint compounds.

Lumber for decks and rails, for launching ways and scaffolds, for shop and office buildings.

Hemp rope and wire rope.

Shipyard cranes.

Cargo winches, both steam and electric drive.

Steering gears.

Windlasses.

Anchor chain and anchors.

Canvas paulins, tarpaulins, boat covers.

Flags and signal flags.

Electric cables and wires, lighting fixtures, generating sets, both turbine and diesel drive, motors.

Pumps, reciprocating, rotary, centrifugal and screw, for both motor and steam drive.

Furniture. Chairs, tables, lockers, berths, all metal fireproof construction.

Deck coverings. Linoleums, rugs, composition, rubber tiling, ceramic tiling.

Plumbing. Pipe, pipe fittings, fixtures of all types and fixture fittings.

Piping. Steam, sanitary, heating, drinking water, sea water, hydraulic, pneumatic.

Propulsion machinery. Geared turbines, reciprocating steam engines, diesel engines, both geared and direct-connected types.

Boilers. Water tube, Scotch cylindrical, waste heat and standby types.

Wireless. Radio transmitting and receiving sets, radio direction finders, multiple outlet antenna systems.

Howard G. Tallerday, San Francisco, president Western Pipe & Steel Co.

Ralph Chandler, Los Angeles, California, director Matson Navigation Company

Navigation. Sounding machines, compasses, sextants, chronometers, charts, gyroscopic compass, revolution counters, course recorders.

Partitions. Screen bulkheads in superstructure require fire-resistant material, preferably metal-surfaced asbestos cored sheets with metal molding covering the joints, and fitted with doors of similar fireproof construction.

The number of ships to be built here during the next three or four years will require bedding, tableware and linen, cooking equipment, sanitary equipment, refrigerating, air conditioning and ventilating equipment, to take care of the normal requirements of about 30,000 men and of carrying space for about 2,000,000 tons of cargo and stores.

This gives just a bare outline of the type of new business opportunities presented by this program to enterprising Pacific Coast manufacturers. Time is of the essence. The National Defense Program is forging ahead. For everyone with a manufacturing plant there is some type of reasonably profitable work available in this vast national spending.

If we all get in to boost this job, we shall be defending American freedom, employing American labor, producing American prosperity and paying American taxes out of America's high standard of living. The Pacific Coast manufacturers have here a wonderful opportunity for good business.

J. L. Hanna, director Standard Oil Company of California

R. W. Gerhart, contracting manager Shipbuilding Division, Consolidated Steel Corp.

Dr. Henry F. Grady, president American President Lines

Pacific Coast Men on American Bureau of Shipping

Recognition of this fast-growing importance of the Pacific Coast as one of the leading shipbuilding centers of America is seen in the recent election of members at the annual meeting of the American Bureau of Shipping on January 28, 1941, at New York.

Nine new members were elected, five of whom were from Pacific Coast, one from the Great Lakes and three from Atlantic Coast, as follows:

Lewis D. Parmelee, executive vice president, A. G. W. I. Lines, New York.

Dr. Henry F. Grady, president, American President Lines, San Francisco, Calif.

Frank D. Bowers, president, International Freighting Corp., New York.

J. L. Hanna, director, Standard Oil Co. of California, San Francisco, Calif.

Howard G. Tallerday, president, Western Pipe and Steel Co., San Francisco, Calif.

Edmond J. Moran, president, Moran Towing and Transportation Co., New York.

Ralph Chandler, Matson Navigation Co., Los Angeles, Calif.

R. W. Gerhart, contracting manager of Shipbuilding Division, Consolidated Steel Corp., Ltd., Los Angeles, Calif.

George W. Codrington, president, Cleveland Diesel Engine Division, General Motors Corp., Cleveland, Ohio.

All of the Pacific Coast members in this new member group have been added to the Pacific Coast Committee of the Bureau. This committee is now composed of:

George Armes
Fraser A. Bailey
Ralph Chandler
John Craig
Kenneth D. Dawson
Henry E. Frick
Fred Galbreath
R. W. Gerhart
Henry F. Grady
Walter L. Green
Alfred S. Gunn
J. L. Hanna
George Jordan
A. B. Knowles
Roscoe J. Lamont
Roger D. Lapham
Sidney Livingston
Joseph A. Moore
George K. Nichols
Carl E. Petersen
Albert F. Pillsbury
Louis Rosenthal
William Semar
Lloyd Swayne
Howard G. Tallerday
Charles L. Wheeler
George D. Zeh

Sound and Radio Aids to Navigation

by Commander I. L. Gill, U.S.C.G.
and
Lieutenant Commander L. M. Harding, U.S.C.G.

Safety in marine navigation is of such paramount importance to commerce that a thorough knowledge of available aids to navigation, established and maintained by the United States Coast Guard, is essential to maritime interests. Familiarity with the aids to navigation as shown in published lists is most important. Ships should be equipped to make the best possible use of aids that are provided and maintained in this country by the Coast Guard, whose personnel has the safety of life and property afloat constantly in mind.

Early Types of Sound Signal

The earliest type of fog signal as an aid to navigation was probably a cannon such as was installed at Boston Harbor early in the eighteenth century.

Bells were introduced at a comparatively early date. At first they were small, and were rung by hand to answer vessels. Larger bells were later developed, and striking machinery, actuated by weight-driven clockwork, was designed for sounding a regular code or characteristic, as, for example, a single or double bell signal every 15 seconds. Many fog bells are now in use—some as heavy as 4000 pounds. They are useful for inside waters, harbors, etc. The latest type striker arrangement for fog bells comprises an electric solenoid plunger type operated from a storage battery and requiring very moderate ampere hour capacity for a whole year's operation, particularly if used only during periods of need when visibility is low.

Trumpets or Reed Horns

An important improvement in fog signal aids was the compressed air trumpet signal, first introduced about 1855. The original trumpet consisted of a steel reed or tongue inclosed in a box attached to a large trumpet or resonator. The unit was sounded by means of compressed air produced by horse-power operating through suitable machinery. The sound was more penetrating than that of bells, but the expense and inconvenience of maintaining a horse apparently prevented its extended use. However, an Ericsson hot-air engine was later utilized as motive power, and trumpets so equipped were established at a number of locations.

A similar device, known as a reed horn, is now in use at some inside locations. The air pressure used is low—in the order of from 3 pounds to 15 pounds per square inch. These are economical as to power requirement, but sound intensity is not sufficient for rough outside stations.

Steam Whistles

Steam whistles were used as fog signals after 1869, the usual sizes being 10-inch and 12-inch whistles of the locomotive type, supplied with steam from an ordinary steam boiler. This type of signal was the most effective type devised up to that time, and in point of sound volume and carrying power is still considered a very efficient aid. Problems of boiler maintenance; the expense of providing fresh water and fuel, especially at isolated stations; the possibility of confusion with the whistle signal of a passing vessel; and also the time required to place the signal in operation in the event of a sudden fog; have tended to abandonment of this type of signal in practically all foreign lighthouse services, as well as in our own country.

Sirens

The siren type of fog signal using steam was introduced in 1868. This unit consisted of a fixed disk with a number of radial slits back of which was a revolving plate with the same arrangement of slits and a resonator at the outer end. Later, the revolving plate was superseded by a cylinder or rotor with peripheral slots. This cylinder rotated inside a casing, also with slots, through which steam or air under pressure escapes through an outer horn or resonator to the atmosphere, being interrupted to form the sound note as the slots or ports are alternately opened or closed by the rotating cylinder inside the rotor casing. The rotor, in some types of signal units, is driven by a separate auxiliary mechanism, so that when air or steam is admitted during a fog signal blast period, the signal note will be uniform. In the automatic type of unit, the rotor is driven by the sounding air or steam under pressure, from storage tanks or boiler, and moves only during blast periods. The sound, therefore, varies from low pitch to high pitch while the rotor is coming up to speed as air or steam is introduced. Rotation in this case is accomplished by reason of relative angularity of slots in the fixed casing and in the moving rotor, the air or steam under pressure moving against the sides of the rotor slots or ports at an angle so as to set the rotor in motion.

The use of steam for siren signals has been generally abandoned in favor of compressed air as a sounding medium, due to economy and efficiency factors. The advantages of compressed air as a sounding medium are distinctiveness of note unlike an ordinary whistle and quickness of placing the signal in operation on the approach of foggy or poor visibility conditions. Modern equipment permits of placing a signal in operation immediately when needed.

Recently the frequency structure of the 6-inch automatic air siren at Race Rock Light Station, New York, was analyzed by means of a portable dry battery-operated analyzer and noise meter. It was noted that considerable momentary sound signal strength was present at the instant of air admission. After the normal speed of the rotor was attained, various harmonic frequencies of the sound note were tuned in and measured for relative strength. The air pressures on the signal were from 45 pounds to 38 pounds per square inch during a 4-second test blast period. Stable operation of the siren seemed to be attained at about 38 to 40 pounds pressure. Fundamental frequency was indicated as about 310 cycles per second with harmonic frequencies of 620 and 930 cycles, each one as strong as the fundamental frequency. A weaker sub-harmonic frequency of 200 cycles and also higher harmonics were also present.

Diaphones

Another and more generally-used type of siren is the so-called "diaphone," originally patented in 1903. Essentially it consists of a brass cylinder casing into which a hollow piston is accurately fitted. It differs from the rotor siren in that the moving part (the piston) reciprocates back and forth in the fixed casing, the sounding medium (air under pressure) escaping to the atmosphere through annular slots or ports in the periphery of the piston and cylinder walls. The head of this piston is of somewhat larger size and fits into a corresponding cylinder fitted with valve-ports so arranged that the admission of compressed air into this driving cylinder (referred to as "driving air") causes the piston to oscillate through a small amplitude at half the frequency of the note which it is desired to produce. Both the cylinder casing wall and the hollow piston wall are provided with light longitudinal ribs, thus permitting them to be cut transversely by the series of slots or ports. As the piston oscillates, the main compressed air supply (referred to as "sounding air") is admitted from the storage air tanks during the blast period. The usual pressure maintained in the storage tanks is from 25 to 40 pounds per square inch. The blast periods at specified intervals—as, for instance a 3-second blast every 30 seconds—are accomplished automatically through operation of valves admitting "driving air" to the driving cylinder and "sounding air" through the cylinder and piston slot or ports, to the resonator horn and outer atmosphere. The sequence of valve operation is controlled by an electric timer operating small solenoid pilot valves. The "driving air" sets the piston into vibration through a small amplitude, and the "sounding air" is admitted a fraction of a second later intermittently through the ports and resonator. Thus the signal note begins to sound only when the piston has attained its normal frequency. The termination of the signal note with a rapid fall in pitch during a small fraction of a second is characteristic of the diaphone. This is known as the "grunt," and its loudness has been measured with a noise meter to be about 50 per cent greater than the main portion of the blast. This "grunt" is oftentimes the only part of the signal heard near the limit of its range of audibility. The reason for this increased loudness is apparently due to the large amount of air being released during final oscillations of the piston.

The marked effectiveness of the "grunt" note at the end of the diaphone blast period led to the development of an important improvement in the 6-inch diaphone, involving the two-tone feature. This was accomplished by providing a by-pass from the "sounding air" chamber around the "sounding air" ports to the "driving air" chambers around the "driving air" ports. The redesign of the unit with increased size of head involved changes in port openings with a view to securing sustained piston reciprocation by virtue of this by-passed air at the natural frequency of the horn. An adjustable needle valve controls the amount of air through the by-pass. When "driving air" is cut off from the "driving air" supply line and admitted only through the by-pass from the "sounding air" chamber, the piston speed is reduced, the sound signal note is lowered to the natural resonator frequency and the frequency structure is materially changed. The "driving air" and the "sounding air" piston valves are operated by separate pilot valves, which may be opened either mechanically or electrically. After opening both pilot valves simultaneously, the higher fundamental tone of the signal with frequency of about 115 cycles per second (with air pressure at 40 pounds per square inch) persists until the "driving air" valve is closed, after which the fundamental sound frequency is reduced to about 60 to 90 cycles per second, thus producing the lower note. Vigorous action of the diaphone piston is maintained meanwhile by action of the small amount of "sounding air" by-passed to the driving chambers around the piston head. The resulting lower tone has generally a greater range of audibility than the higher tone, due to the fact that its harmonic structure has much greater energy content than the fundamental note, and produces a correspondingly greater auditory sensation. This will later be discussed more at length.

Diaphragm Horns

A vibrating diaphragm type sound signal unit actuated by steam or air under pressure and escaping to the atmosphere through a properly designed resonator is a very effective type of sound signal. Such units have been in use in this country since about 1929. The diaphragms are circular, of thickness suitable to their diameter and air pressure used, and are used singly, or in multiple, when necessary for proper flexure. The diaphragms are loosely supported at their outer edge with center area seated on a circular orifice. Air is passed from the orifice to the resonator horn as the diaphragm vibrates on admission of compressed air to the diaphragm chamber from the storage tanks. Proper pressure on the inlet side of the diaphragm is established by the size of the orifice leading to the diaphragm chamber, sometimes adjustable by a plug valve with a lock nut to throttle the air through the orifice. Since diaphragm chamber pressures for sizes of signals usual in fog signal practice are low (9 to 15 pounds per square inch), a storage tank pressure of perhaps 25 to 30 pounds is adequate with the proper design of orifice leading to the diaphragm chamber. This type of signal is made especially effective by combining suitable different frequencies in duplex or triplex horn units, and the individual horns may be oriented to cover a wide arc of horizon most effectively.

Electric Air Oscillators

This type of signal unit has been used to some extent for fog signal purposes, and some are in use today. The sound wave is set in motion by means of the oscillating diaphragm only acting on the free atmosphere through a compression chamber and a suitable resonator. The sound frequency structure for a single unit comprises a fundamental much stronger than any of the harmonics, and this character of sound structure, when heard at any considerable distance, lacks distinctiveness. The single frequency is difficult to locate as to direction.

A very effective signal can be obtained by simultaneous sounding of two or more air oscillator units of different frequencies, thus building up a frequency structure strong in the harmonics, with resultant loudness efficiency and with good indication as to direction. Such a combination of oscillators was tested over various distances at sea during the fall of 1938 at Cape Henry Light Station, Virginia, and was compared with 6-inch diaphones (both standard and two-tone units). A multiple oscillator (260, 360 and 495 cycle frequencies) compared favorably with the diaphones, though the signals were not generally as loud. However, the diaphone power requirement was nearly three and one-half times that needed for all three electric oscillators together. If the number of electric oscillators were to be increased, more favorable results would undoubtedly be obtained. The multiple oscillator unit is being installed at Fort Gratiot Light Station, Michigan, and will thus be service-tested over a period of time under varying weather conditions.

General Power Considerations

The power requirement for the most effective output of a given signal unit bears a relation to the size of the moving element and its velocity and amplitude of motion. The larger the moving element the greater the volume of air it sets in motion as a sound wave, and the greater the power that can be transferred to the sound wave for most effective results. The relation of power requirement to amplitude of motion is indicated by the general law that intensity of sound increases as the square of the amplitude of the propagated sound wave. German experiments at Kiel to determine the relation of audibility range of sound transmitters to pitch of signal indicated that for pure tones, with a given power input, the range of audibility for bare perception of signal is greater in the case of low-frequency signals, and that this range increases more rapidly with an increase of power than for higher frequency signals. For hearing signals at good volume, however, through ships' noises at sea, the advantage of low frequency in this respect seems to be lost until the power has been greatly increased. These results are also confirmed by the frequently-observed high signal strength at short distances of low-powered signals at fairly high pitch or frequency. A practical application of these observed results is obtained in the use of the 2-tone diaphone (reciprocating piston instrument) which combines the arresting quality of the high tone note over medium distances with the long range of audibility of the low tone portion of the blast. Frequency analysis of the diaphone signal indicates a rich harmonic structure covering a wide frequency range. The signal is effective at various ranges under different weather conditions.

While audibility range is increased with increase of input power, such increase in range falls short of being proportional to the power increase. This, of course, is due to decrease of intensity with distance, according to the law of inverse squares and to the further effects of wind, temperature and acoustical degradation losses. Tests conducted over a period of two weeks during October, 1925, off Whitefish Point in Lake Superior on the Great Lakes gave comparisons of average ranges of audibility of types "G" and "F" diaphones and 6-inch rotating air siren. Reports were received from observers on 139 commercial steamers. The summary of results is shown in Table 1.

TABLE 1. AVERAGE DISTANCES HEARD (IN MILES)

	Diaphones "G"	Diaphones "F"	Siren
In front of resonators...........	4.27	4.08	3.67
In rear of resonators............	2.62	2.54	2.44
Average (both directions)........	3.45	3.31	3.05
Air consumption c.f.s...........	24.00	12.00	16.00

Various wind conditions, from light winds to gales and snowstorms, were encountered, but the prevailing winds were cross winds.

Tests made during September, 1935, at the Cape Henry, Virginia, Fog Signal Testing Station, on the Atlantic Coast, indicated very little advantage for the type "G" diaphone as compared to the two-tone type "F" diaphone, although the smaller diaphone uses little more than half as much air as the larger "G" type unit. Signal strength readings at distances of 8.5 to 10.4 miles indicated both signals about equal in intensity at from 30 and 25 decibels above the threshold of hearing. The air consumption of type "G" and type "F," respectively, was about 26 and 14 cubic feet of free air per second of blast at 40 pounds per square inch pressure. The observing ship was easterly from the signal, on the axis of resonators. The weather was clear with a 7-mile east and southeast wind, the humidity was 75 per cent, the temperature 74 degrees F. and the barometer 30.03. Thus a practical, economical limit of power is indicated in connection with any given signal unit.

Design and Type of Signal Unit

The most effective types of signal units in use in the United States are considered to be reciprocating piston and rotor type sirens, diaphragm type horns and whistles. Of these most effective types of signal units, power considerations are gradually eliminating all except the reciprocating piston type diaphone and diaphragm type horns. Signaling units are designed for the desired frequencies—in other words, for the character of the tone. Experience seems to indicate that a signal unit with a strong harmonic structure has advantages of arresting qualities and effectiveness under varying weather conditions over relatively pure tone instruments. Under certain weather conditions, a high-pitch signal has been heard farther than a signal with a lower tone. Temperature and atmospheric homogeneity affect the audibility range. Absorption of the higher sound frequencies apparently increases rapidly with temperature increases. On the other hand, under conditions of low temperature, high-frequency sound waves, which are more favorable to human ear response, may be heard further than a lower frequency signal.

Sound Resonator Design

The design of the sound resonator is determined by the needs as to spread of the sound waves around the horizon, its proper relationship to the predominant sound frequency, and by a matched resonant frequency with the natural frequency of the oscillating element. Resonators of various lengths up to 22 feet with 6-foot diameter mouths have been tried, but experience has shown that shorter horns are equally effective. Resonator horns, both horizontal and vertical, as furnished by the manufacturer of the signal units,

TABLE 2.—FREQUENCIES (CYCLES PER SECOND)

Note: Relative range of amplitudes is indicated beneath frequency as averaged from several readings.

Sound transmitter (compressed air at 40 pounds pressure)	Fundamental	Harmonics					
425 mm. Tyfon (diaphragm horn)	92	184	276	368	460	552	644
	640–670	375	225–260	22–68	60–68	45	19–26
300 mm. Tyfon	103	206	309	412	515	618	721
	265–280	240	93–106	85–101	64–74	74–80	106–125
200 mm. Tyfon	153	306	459	612	765	918	Not further
	850–1480	160–420	160–420	106–265	21–85	21–85	explored
170 mm. Kahlenberg diaphragm horn	170	340	510	680	850	1020	1190
	119–136	102–170	68–136	136–204	50–119	14–41	4–7
200 mm. Clark-Cooper diaphragm horn	130	260	390	520	650	780	910
	740–1060	420–950	106–320	42–106	85–150	127–210	11–42
Diaphone F-2-tone (low tone only)	60	120	180	240	300	360	etc.
	47–108	350–940	940–2800	350–820	700–1880	235–1180	etc.
Diaphone F Type (300 feet from signal)*	115	230	345	460	575	690	805
	53–64	320–420	21–32	110–160	11–42	42–64	2–10
(1.2 miles from signal)	Not more than 0.2	2.1–3.7	0.53–2.1	Over 10	Very small	......	....
(1.7 miles from signal)	Less than 0.2	2.0–3.0	Less than 0.1	1.0–15.0	0.07–0.17	0.27–0.34	....
300 mm Cunningham diaphragm horn (at 300 feet from signal)	115	230	345	460	575	690	805
	900–1200	900–1000	100–200	150–200	80–160	80–140	
(at 0.9 miles from signal)	3.2–5.3	3.2–5.3	3.2–4.2	3.2–4.8	3.2–4.2	2.1–3.2	....

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* This signal horn was pointed away from the point of observation and was shielded by a fog signal building. Other units pointed at right angles from the point of observation.

are generally used, having been adopted after extensive tests and research. The horns are either conical or exponential in shape. The manufacturer of the diaphone found through experiment that a 14-degree resonator is best for distributing sound all around the horizon. A wider angle concentrated the sound along the axis of the resonator. The length of the horn was determined by trial. Experiments made by Allen Cunningham (now deceased) of Seattle, Washington, showed that the best efficiency of a diaphragm sound unit is attained when the length and shape of the resonator are such as to respond to the natural sound frequency of the diaphragm. An improper length and shape apparently force an unnatural frequency on the diaphragm, resulting in decrease of efficiency. The maximum audibility range of the horizontal resonator is naturally in the direction of the axis of the resonator. If equal distribution of signal strength is desired all around the horizon, it has been found that where only a single unit is used, a vertical horn with a mushroom top deflector is practical for the purpose.

Frequency Structure of Sound Signals

Although the human ear is most sensitive to high frequency notes in the range of 1000 to 5000 cycles per second, such frequencies are apparently not practicable for fog signal purposes, as they are absorbed more rapidly than signals of lower tone. Their range of audibility is therefore limited. Experience has shown that the most effective pure tone frequencies are in the range below 500 cycles per second—most effective where only small power is available in the range from 250 to 500 cycles per second; but where the available power is ample, the best frequencies are below 250 cycles, increasingly lower with increase of power. The work of Fletcher and Munson in this country, dealing with the relationship of loudness or magnitude of auditory sensation to sound intensity and frequency structure, has shown that the loudness of sound with a harmonic structure is much greater than that obtained from the same intensity applied to a single frequency tone. Data also shows that tones with a fundamental frequency of from 400 to 800 cycles per second, and which are rich in overtone structure, are louder than sounds of lower or higher pitch having equivalent intensity levels. Of course, it must be remembered that sounds with fundamental frequencies in this range may not be the most effective as to range of audibility, because of effects of absorption, etc., in propagation through the atmosphere. It is also shown that the loudness of sounds of low pitch with a harmonic structure is due in large measure to the higher frequency harmonics present.

On November 9 and 10, 1936, several different fog signal units such as are used as aids to navigation were operated at the Cape Henry Fog Signal Testing Station on the Atlantic Coast, and the emitted sound waves were analyzed by a wave analyzer. This instrument was capable of tuning to various frequencies present in such a way as to show by voltmeter the relative amplitudes of the various harmonics. Some of the results obtained are tabulated in Table 2.

Particular interest attaches to results shown by the last items of Table 2 for the diaphone and the 300 mm. Cunningham horn. The results seem to indicate that the harmonic frequencies above about 300 cycles per second were propagated with less loss of energy over an increasing distance range than the lower frequencies. Weather conditions did not permit further research of this phase. Further confirming data are desirable. The great efficiency of the low tone of the two-tone diaphone is shown by the above data and discussion to be due apparently to the extensive strong harmonic structure involving frequencies of from 120 to 720 cycles per second and probably higher—on a fundamental note of 60 cycles per second.

Reference has heretofore been made to the advantages of multiple frequency signal units under varying weather conditions. General experience has shown that sounds with a high pitch are good to cut through storm and ship noises at sea. Special observations (215 all told) by Great Lakes mariners during the 1935 season of navigation covered audibility ranges of five different fog signal units, four of which were air diaphones and one a steam diaphragm signal. The average ranges reported for the different units varied from 8 to 12 miles.

Wind and Temperature Conditions

It is known that wind, temperature and humidity gradients deflect or bend the path of a sound wave. Sound waves traveling with the wind are believed to be bent down from the upper atmosphere by the greater velocity of upper air, and are therefore effective at greater distances to listeners near the water surface, whereas sound waves traveling against the wind would likewise be deflected upwards, reducing the audibility range on the surface. An upper wind blowing in an opposite direction from the surface wind may explain the existence of a sound shadow or silent zone when the sound is moving against a surface wind, becoming audible again at a greater distance. In such a case its upward refraction causes the sound to be lost to surface listeners at a certain distance from the sound source, and it is re-

(Page 39, please)

All of the United States lighthouses are equipped with sound and/or radio aids to navigation

The Commission

REPORTS MARITIME PROGRESS

In a very comprehensive and well-organized document, Admiral E. S. Land, chairman of the U. S. Maritime Commission, makes his report to Congress for the period ending October 25, 1940.

This report in its first paragraph strikes an optimistic note and turns a very dark cloud into a decided silver lining. After describing the progressive blockout of European ports by neutrality legislation and presidential proclamation, it finds, "Despite this block-out of an area which normally handles over 40 per cent of our total foreign commerce, American shipping has prospered during the past year."

Nearly all trade routes formerly served by European tonnage were left open to American ship operators, and the American tonnage serving European trade routes was diverted to other routes showing a scarcity of bottoms.

Increase in freight rates was made possible by the greater demand and fully justified by higher costs of operation.

Vessel Construction

The report shows that as of October 1, 1940, contracts had been let for:

1 passenger liner
38 C-1 cargo vessels
40 C-2 cargo vessels
30 C-3 cargo vessels
18 C-3 passenger and cargo vessels
6 special* passenger and cargo vessels
21 special* cargo vessels
23 tankers

117 vessels

Of these, 108 keels had been laid, 66 hulls had been launched and 47 completed vessels delivered, as follows:

1 passenger liner
17 C-2 cargo vessels
11 C-3 cargo vessels
2 special* passenger and cargo vessels
5 special* cargo
11 tankers

Approximately 100 of these ships have already been contracted for by private operators under Title V of the Merchant Marine Act of 1936, and an additional 35 are under commitments for charter under Title VII of that act. Twenty-three of these ships are National Defense feature tankers, which are rapidly being taken over by the U. S. Navy. The Navy has also taken over seven C-2 and C-3 cargo carriers.

Total cost of these 177 vessels will amount to $438,318,000, on which progress payments of approximately $172,000,000 have been made to shipyards. Operators who purchased vessels under Title V have shared in these payments to the extent of $26,700,000.

The Commission, in view of the difficulty of obtaining accurate current information, has been authorized to base construction differential subsidy awards on foreign costs prior to September 3, 1939. The rising costs of American shipbuilding are making the construction subsidies larger.

Operating Subsidies

There has been considerable shift in the subsidized lines during the year, due to sale of vessels foreign, temporary lay-up of some of the larger ships and various reallocations of cargo carriers. The tabulation herewith shows the number of voyages and accrued subsidies for each of the twelve subsidized lines operating in the fiscal year 1940:

Accrued operating-differential subsidy voyages and inactive periods, July 1, 1939 to June 30, 1940

	Number of voyages	*Accrued subsidy*
American Export Lines, Inc......	96	$1,578,744.37
American Mail Line, Ltd..........	1	20,592.72
American President Lines, Ltd...	48	2,664,503.62
Grace Line, Inc.................	58	1,130,567.99
Lykes Bros. Steamship Co., Inc...	183	1,422,001.98
Mississippi Shipping Co., Inc....	42	449,335.16
Moore-McCormack Lines, Inc....	110	1,387,588.19
New York and Cuba Mail S.S. Co.	128	370,407.46
Oceanic Steamship Co...........	13	688,871.76
Pacific Argentine Brazil Line, Inc.	2	36,701.85
Seas Shipping Co., Inc..........	14	212,270.29
United States Lines Co..........	90	2,143,005.35
Total	785	$12,104,590.74

This total represents an increase of approximately 10 per cent over the previous year, although there is a decrease in the total of voyages completed. This again reflects the increase in operating costs and shows the wisdom of the annual subsidy adjustment policy.

Rising wage rates, increased fuel costs and war risk insurance, are the principal items in upping the operating costs.

Training Personnel

The Commission has initiated three distinct training services:

(1) The United States Maritime Service (operated for the account of the Commission by the United States Coast Guard) is in charge of training activities for men with previous experience at sea. Stations at Hoffman Island, New York, and Government Island, Alameda, California are maintained for unlicensed men; and at New London, Connecticut, and Alameda, California, for licensed officers. During the two-year period ending September 20, 1940, the total enrollees in the Maritime Service numbered 962 licensed and 3956 unlicensed persons.

The cost of this service approximates $175 per unlicensed man month, and $275 per licensed man month.

(2) A training system for apprentice seamen with an actively-operating station at St. Petersburg, Florida, and another under construction at Hueneme, California. The first class of enrollees, principally young men selected from the C.C.C., has completed the one-year course, and a considerable proportion of them are being employed in the merchant marine, while others are taking special courses in the marine radio school at Gallups Island, Boston, Massachusetts. To date over 1000 young men have enrolled for the apprentice seaman course. Two steamers and two sailing vessels are maintained for practice cruises. Average cost, $175 per man month.

(3) The cadet-officer system on board merchant vessels. The cadet course is for

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*Indicates owners design

four years (three at sea and one at a shore station). A constant course of study, combined with sea experience and subject to periodic examinations for promotion to higher ratings in the system. To date 355 cadet officers, and 544 cadets, have been enrolled. Average cost, $30 per man month.

A correspondence course is also provided, open to all personnel. As of June 30, 1940, this course was being taken by 265 cadets, 64 cadet officers, 934 members of the Maritime Service and 126 additional seagoing persons.

This makes a total of approximately 7000 persons taking constant or intermittent training courses under these Commission services. Quite a maritime university!

Insurance

The Commission fund for insuring Government liens on American merchant ships has been called on to carry unusual amounts, due to the restrictions in the foreign market and to war risks. The total amount underwritten on 62 privately-owned vessels is $35,418,590, and, in addition, war risks amounting to approximately $71,000,000.

The fluctuation in the division between the foreign market, the American market, and the Commission fund is shown by the tabulation herewith:

	Fund Percent	*American* Percent	*Foreign* Percent
June 30, 1935	6.897	45.38	47.73
October 26, 1936	5.72	43.78	50.5
October 25, 1937	5.1	41.5	53.4
October 25, 1938	5.2	46.5	48.3
October 25, 1939	6.4	46.2	47.4
October 1, 1940*	16.8	50.48	32.72

Litigation and Claims

Period opened with 195 cases on docket. Eighty-one were disposed of and 82 added, so that period closed with 196 cases in litigation, involving over $30,000,000.

On October 25, 1940, 34 claims (not in litigation), involving $81,000,000, were pending.

Regulatory Functions

Forty-four "formal docket" cases were settled during the year, leaving 37 pending on October 1, 1940. Fifteen complaints were filed under the "informal docket," which had three pending. Fourteen were closed and four are pending. Fifty-nine cases were added to the 58 pending under "special docket." One hundred and ten were closed, leaving seven pending.

During the period, 7355 tariff schedules were received for filing. Eleven of these were rejected after examination. Three hundred and ninety-two special-permission applications for tariff changes were received.

On October 1, 1940, there were on file 1759 effective agreements, of which 126 were conference and 27 pool, the balance being individual firms. Of this total, 914 were approved during the year under review.

Transfer to Alien

The Commission during the year approved the sale and transfer to alien registry of 287 vessels, with a total gross tonnage of 1,005,783 gross tons, and an average age of 21.25 years. Of these the British got 113 ships, of 415,302 total gross tonnage. Panama registry got 41, of 184,965 gross tons; and Brazil, 17, of 86,822 gross tons.

The Commission also approved the charter to aliens of 370 American vessels. The majority of these charters involved tanker operation for one voyage by a foreign subsidiary of an American oil company.

Government-owned Lines

During the year, the Commission disposed of the last remaining two Government-operated steamship lines, and now for the first time in 21 years the Federal Government is out of the directly-operated steamship business.

Laid-up Fleet

During the year, five vessels were placed in lay-up and 55 withdrawn, making a net deduction of 50 ships, and leaving a total of laid-up fleet of 63 vessels. Of these, 36 are on the Atlantic Coast, 25 at New Orleans and 2 at Bremerton, Washington.

NOTE: Since October 25, 1940, the majority of these 63 vessels have been disposed of, and the laid-up fleet is approaching the vanishing point.

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*NOTE. The fund percentage is unusually high and the foreign percentage is unusually low because at the time 3 high-valued vessels were insured a large section of the British market could not be used as it had not made deposits in this country. If the fund could have been limited to its usual participation its percentage would have been 7.1 per cent instead of 16.8 per cent.

The Fully-Welded Hull

Some Suggestions for Structural Arrangement to Allow Low-cost Welding

by David W. Dickie

Herein an effort has been made to arrange the structure of the ship to come within the limitations of low cost welding practice.

The midship section shows a vessel of the same dimensions as the Maritime Commission C-3 ships altered to fit a particular trade. Leaving the Pacific Coast there will be a deck load of lumber 10 feet high stowed on each side of the deck outboard of and clear of the hatch coamings. The cargo lashings will be attached to the deck outboard of the hatch coamings and at the ship's side with the turnbuckles above and the hatches will be clear for loading and discharging at all times.

The lower hold will be stowed with lumber up about 14 feet. The remainder of the hold and the tween decks will be stowed with flour in sacks, canned goods in paper cartons, cotton in bales, hops in bags, sugar in sacks, etc., etc., the usual Pacific Coast cargo. Returning, the vessel will have steel, plain and fabricated in the hold and upper tween decks, paper, bagging, household goods, dry groceries and general cargo.

To obviate broken stowage, deep framing with narrow stringers is sustituted for regular frames combined with web frames every third or fourth frame and wide stringers. Regular deck beams are substituted for strong beams and longitudinal framing to save space in the depth of the ship and facilitate proper air circulation.

The decks are spaced high enough to provide room for operating the stowage jitneys so the operator's head will clear the beams and close enough to avoid crushing the cartons of case goods due to excessive height.

There are two hold pillars under the side hatch coamings in each hold spaced to facilitate stowing long lengths.

In No. 1 hold an orlop deck is fitted to avoid too great depth of hold and the double bottom is made deeper forward and aft to provide a wider floor in the hold.

The Manual Welder

The art of welding is changing so fast that before a description can be intelligibly presented the particular method has passed into oblivion.

To maintain his status the manual welder has to cover a minimum footage and where piecework prevails there is a variation of over 100 per cent in the output per man. To cover distance the manual welders want to use 3/16″ welding rod and even larger on flat and horizontal work. The heat necessary to fuse the larger rods produces heat and shrinkage buckles in the work. The expense of correcting distortion is directly chargeable to the welding job. Somewhere between is a point of minimum cost where less than the maximum footage of welding is combined with less straightening expense.

The welding shops have, say, six top flight welders and 2 trainees permanently employed. There is a group of welders that serve all the shops thereby securing permanent employment. These welders are qualified to go from a sheet metal job to one where the plate is ¾″ thick and can weld overhead. The disturbing consideration is the human element requiring keen discernment upon the part of the foremen.

In the shipyards where several hundred welders may be employed they come from the schools with a qualifying certificate and about 15% survive the first employment. After several attempts they learn to handle themselves in awkward positions to meet the competition of more experienced men.

If buckles in the plates are to be minimized the structure must be designed so that as much of the welding as possible may be done with automatic machines.

Automatic Welding Machines

The automatic machines are of two general types designated by their patented trade names as Unionmelt and Unamatic.

The Unionmelt uses a glass sand which is deposited on the seam to be welded as the wire is fed to the work. The welding wire is coated with copper. The fusing is started by placing a small compact mass of steel wool in contact with the welding rod and the steel work before turning on the current. Once the welding is started the machine continues to fuse the rod and the steel work in a molten stream at the same time melting and fusing a coating of the glass over the work. The glass disengages itself from the work as it cools and the excess glass sand is picked up by the vacuum suction machine for subsequent use.

A small piece of steel is held against the edge of the plate at the end of the welded seam to keep the molten metal from flowing away from the weld before it sets.

The Unamatic machine has two motors running in opposite directions, one feeding the welding wire toward and one drawing the wire away from the work by means of a differential similar to an automobile rear end. The feed motor runs at constant speed and the draw motor at variable speed depending on the voltage across the arc. When the welding rod touches the work the draw motor draws it away forming the arc. The flux is in the form of a tape ⅞″ wide pressed onto a fine wire mesh. It is automatically wrapped around the welding rod and forms a flux coating over the arc. The eyes of the welders have to be protected by actinic glass while operating the Unamatic welder.

Since machine welding has to be done on a horizontal plane the work has to be arranged to bring the parts to be welded together as nearly level as possible. It is possible to deposit metal in a weld by the machines against an adverse angle of 7 degrees (1½″ to 1 foot) but it is better to limit the adverse angle to about 5 degrees (about 1 1/16″ to the foot). That is to say if the work is 5 degrees out of level the weld will cool fast enough to keep the molten metal from flowing away from the weld.

Machine Welding

Where two plates are to be joined a light downhand manual weld is made on the upper side. The plates are turned over and a groove is burned along the seam with a hook burner or gouging tool which also removes the flux and slag from the manual weld. The burning warms the adjacent metal and prompt welding by the automatic welding machine produces an excellent job.

If the plates are thick enough to warrant they are beveled before assembly, a light hand weld made in the bottom of the "V" and the seam machine welded. The plates are then turned over and a finish machine weld made on the other side.

The ideal method of preparing the edges of the plates is to plane them. The edges can also be prepared by cutting them with the acetylene flame.

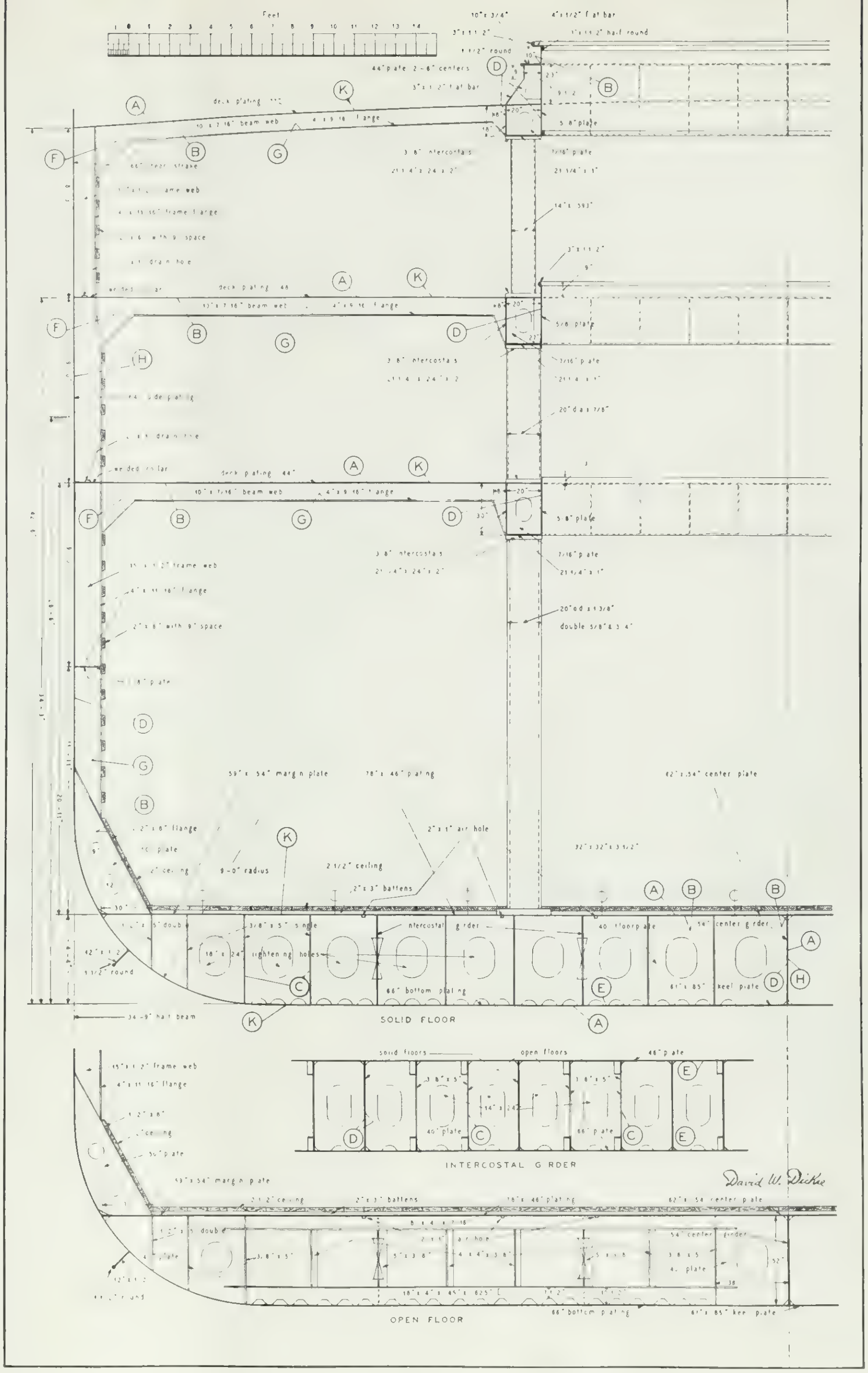
The use of copper strip or glass sand backing has practically been abandoned. If a steel backing strip is used it must be welded on the edges to prevent corrosion between the plate and the backing strip. This will not stop fatigue corrosion taking place on the surface of the plates near the backing strip.

It is sometimes necessary to tack weld strongbacks across a refractory butt to bring it to its proper place before welding.

Where a vertical flange of an angle or vertical plate is to be welded to a horizontal plate the welding head is tilted and a weld is made on each side of the vertical flange or plate, the machine going first on one side and then on the other.

Another method applicable to plates $3/8''$ thick or less is to leave a gap of $1/8''$ between the vertical flange of the angle or vertical plate. The glass sand is piled on the back side of the vertical member and the weld is made on the front side. The glass sand on the front side comes from the feed on the machine. The weld will flow through the $1/8''$ gap and fuse a film of glass on each side of the vertical member and will complete the weld in one pass. The heat flowing to the glass sand cools the surface of the weld and keeps the molten part imprisoned until it has a chance to set.

A third method is to have two welding heads, one on each side of the vertical plate or angle and weld simultaneously from both sides. This method entails less heat loss, less current and the welding is done faster than with either a single pass on one side or a pass on each side consecutively.



Proposed midship section for a welded C-3 hull

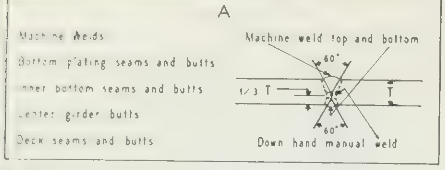
The size of the vertical angle or plate to be welded is limited by the portal between the heads of the machine. Where the vertical plate is 4 to 5 feet high as in the case of a floor plate the carrying carriage becomes quite large.

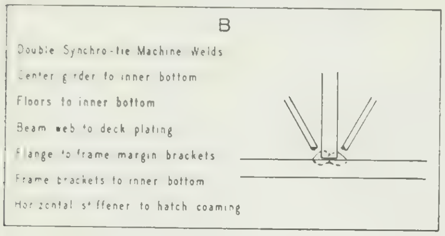
A fourth method is to make a mark across the work under the member to be attached to act as a starting guide. Two welding heads with a gear wheel running on a small geared track, one on each side of the vertical plate are fitted with single phase, two pole, one-half horsepower Selsyn or Synchro-tie motors so they will travel in step along the work, thus keeping the two welding rods in register.

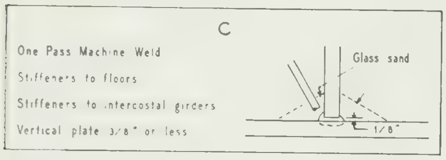
To secure small fillets with the welding machines, small welding wire must be used and to avoid the chore of changing the size of the wire the work should be laid out as far as possible to use the smallest standard fillet that will give sufficient strength.

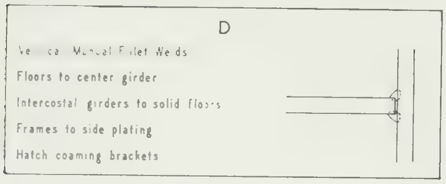
Thermit Weld Process

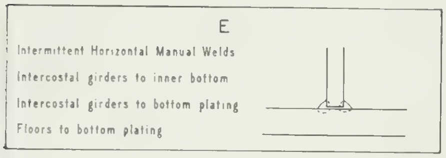
In cases like the beam brackets and similar connections where there are two or three standing flanges coming together at an intersection it is possible to make molds of refractory materials and weld

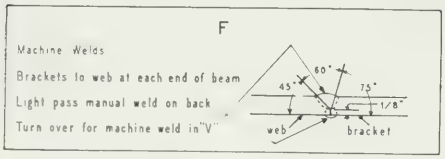


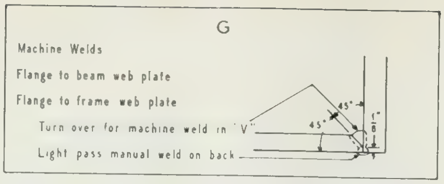

B
Double Synchro-tie Machine Welds
Center girder to inner bottom
Floors to inner bottom
Beam web to deck plating
Flange to frame margin brackets
Frame brackets to inner bottom
Horizontal stiffener to hatch coaming

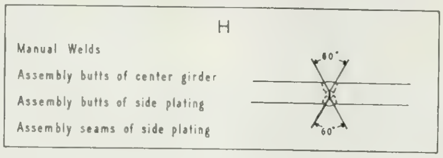

C
One Pass Machine Weld
Stiffeners to floors
Stiffeners to intercostal girders
Vertical plate 3/8" or less
Glass sand
1/8"

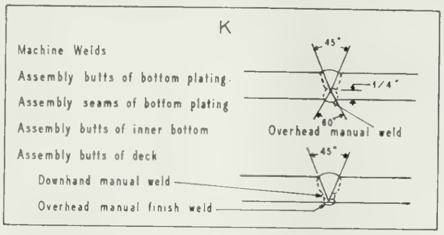


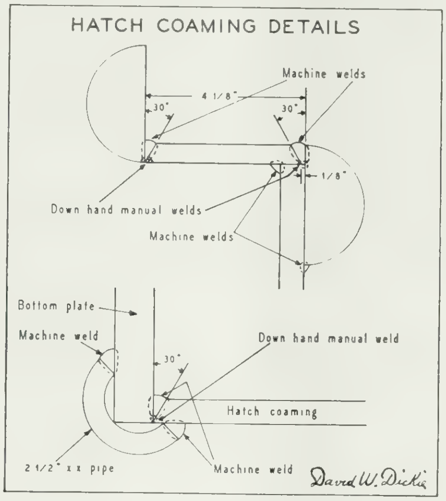

E
Intermittent Horizontal Manual Welds
Intercostal girders to inner bottom
Intercostal girders to bottom plating
Floors to bottom plating


F
Machine Welds
Brackets to web at each end of beam
Light pass manual weld on back
Turn over for machine weld in "V"
60°
45°
75°
1/8"
web
bracket


G
Machine Welds
Flange to beam web plate
Flange to frame web plate
Turn over for machine weld in "V"
Light pass manual weld on back
45°
45°
1"
8


H
Manual Welds
Assembly butts of center girder
Assembly butts of side plating
Assembly seams of side plating
60°
60°


K
Machine Welds
Assembly butts of bottom plating
Assembly seams of bottom plating
Assembly butts of inner bottom
Assembly butts of deck
Downhand manual weld
Overhead manual finish weld
45°
1/4"
60°
Overhead manual weld
45°



the flanges together with the Thermit weld process.

Manual Welding

Obviously there must be some "hand welding" done to finish the work. Formerly the "step back" method was used. It consists of:

(1) Depositing a bead 3″ to 12″ long in the seam—skip 3″ to 12″—deposit a bead 3″ to 12″ long—skip 3″ to 12″—deposit a bead 3″ to 12″ long and stop.

(2) Go back and deposit a bead between the previous welds and stop.

(3) Chip the root of the former weld to remove all traces of the flux that may be present.

(4) Deposit beads of welding on the back side in the same manner as (1).

(5) Deposit beads of welding on the front side in the same manner as (1).

More recently the multiple pass method is used. Weld the butt of the plate continuously from edge to edge in an upward direction if the butt is vertical using a 4/32″ rod in the bottom of the "V"—make the next pass with a 5/32″ rod—and complete the weld with a third pass using a 6/32″ rod. Making manual welds with larger rods generally results in buckling the plates. The process requires that the operator weld continuously without a rest until the butt is finished or the work will cool and set up strains in the weld.

The purpose of changing the size of the welding rod for the succeeding passes is on account of penetration. The "V" weld angle in plates up to ⅝″ thick is usually 60 degrees and the thin edge of the plate is about ⅛″ thick which permits the use of the 4/32″ rod. The gap gets larger as it approaches the surface of the plate and a larger rod is necessary to get sufficient heat for penetration. If an equal "V" is cut on each side of the plate and the subsequent passes made from both sides, less welding rod is required and there is less buckling of the plate at the butt.

Intermittent welding is accepted in places where water tightness and excessive strength are not required. This consists of welding for a distance of 3″ leaving a space between so the welded places are from 8″ to 12″ centers, called chain welding if the welded places are opposite and staggered welding if they are not opposite. It is now conceded that a "light continuous weld" is stronger than an "intermittent weld" and is quicker to make. Also the defect at the beginning and the end of the intermittent weld due to the presence of flux and slag is avoided.

When the human element is overcome a continuous weld will be made in one pass from both sides simultaneously, each welder using a light rod and low heat at a much faster rate than is now possible using multiple passes.

The intermittent weld will still have to be used when there are drainage serrations in the structure.

It is not possible to make hand welding as strong as machine welding but even a hand welded seam made by a skilled operator is stronger than a riveted seam.

If an attempt is made to build up a seam by either the "step back" or the "multiple pass" methods without removing all traces of flux or slag from the previous work, the heat will volatilize the flux from the previous pass and cause minute bubbles throughout the weld. The porous places will have to be chipped out and rewelded to prevent corrosion within the weld.

Speed is the essence of good welding as the plate has a chance to cool as a unit instead of being cold in one place and hot in another. A rudimentary precept applicable to all welding is "Keep the work and the tools clean."

Bottom Plating

The plates of the bottom of the ship are pressed to shape and assembled on the welding rack. Each strake is placed end to end and the butts welded on the water side with a light pass manual weld in the bottom of the "V" followed by a machine weld. The strakes are then placed edge to edge and receive a light pass manual weld in the bottom of the "V" followed by a machine weld. Any buckling that develops is corrected by heating and cooling.

The large sheet is braced, turned over and lifted to the building slip. After the sheets are assembled on the building slip a light pass manual overhead weld is run on the under side of the remaining seams after which any buckling is corrected by heating and cooling.

To save time a light pass down hand weld can be run in the bottom of the "V". The seams and butts are cleaned of all flux and slag by gouging and chipping and finish welded by machine on the dry side in long runs. The overhead finish weld on the water side is run along the remaining seams without holding back the other work.

The shrinkage varies, averaging about 5% of the surface weld gap per butt or seam. The shrinkage coefficient for butt welding is not the same as for fillet welding when done automatically by machine.

Inner Bottom

To make the strength of the floors of the inner bottom effective, the floors on each side of the centerline girder should be directly opposite. If each side of the inner bottom is made as a unit uneven lengthwise shrinkage may cause failure of the corresponding floors on each side of the centerline girder to register. Also a very important vertical weld, that of the floor to the centerline girder will have to be made within the double bottom where inspection is handicapped by lack of light. To insure good workmanship the best procedure is to weld a section clear across the inner bottom.

There are from 8 to 10 bents consisting of one solid floor and two intermediate open floors per bent in the length of the hold. Each double bottom bent consisting of the inner bottom plating, one solid floor, two open floors, four intercostal girders and one center girder weighs approximately 12 tons of 2000 pounds.

If all the floors were made of the solid type, much of the hand welding such as the end of the struts, and the ends of the flanges can be eliminated.

To build a ship of the C-3 size the cranes should have a radius of 64 feet to reach the centerline of the ship. To effect economy in welding at least 5 bents should be welded into a unit assembly giving a lift of 60 tons. By having two cranes, one on each side of the ship making a lift on the quarter beam or 45 feet radius the load comes within the scope of the standard shipyard cranes. The height to the boom pin should be 75 to 80 feet to clear all obstructions and the crane should be capable of lifting 40 tons at 64 feet radius.

Once provision is made to lift the sections the welding procedure becomes quite simple. Place the inner bottom strakes horizontally butt to butt and weld them. Move the long strips together and weld the fore and aft seams as described for bottom plating. Lay the centerline girder plates horizontally butt to butt and weld them as described for bottom plating. Erect the center plate girder vertically and weld to the inner bottom using the duplex Synchro-tie welding heads.

The assembly of the stiffeners to the solid floors, brackets and stiffeners to open floors and stiffeners to intercostal girders is arranged to do all the welding by machine on the flat from one side with the exception of one stiffener on the under side of each floor. The floor has to be turned over to weld this stiffener. Where the flanges intersect on the open floor the Thermit weld process can be used. The frames of the open floors for a distance amidships can be made from an 18″ x 4″ x .45″ x .625″ (42.7 lbs.) channel split with the hydrogen flame to form the drainage serrations but elsewhere are best made as described under side framing.

After assembly the floors are erected on the inner bottom, welded to the center girder by hand and welded from each side to the inner bottom by machine. See Machine Welded Side Plating for discussion of the shrinkage.

The intercostal girders are erected in place and welded to the solid floor at one end manually. Up to this point all of the welding with the exception of the attachment of the floors to the center girder, the attachment of one end of the intercostal girders to the solid floor and the light pass work has been done by machine.

Also only continuous members have been welded by machine—that is—the inner bottom and the floors after attachment to the center girder are solid metal clear across. In this way transverse shrinkage has been eliminated as a disturbing factor.

Welding the free ends of the intercostal girders to the floors presents a difficulty on account of the shrinkage. However intermittent welding or a light pass continuous weld is acceptable and by separating the end of the intercostal girder from the floor a little with a gib headed fin to allow for about 5% of the weld as shrinkage the floors will spring back into place close enough for all practical purposes. The only remaining hand welding is the attachment of the intercostal girders to the inner bottom by intermittent welding and the attachment of the stiffeners of the intercostal girders to the frames and floors of the open floors.

Before the inner bottom assembly is lifted the top side of the shell plating and the floors should have clip attachments welded in convenient places to draw the work together with turnbuckles. The drawing up of the work can be done with powerful magnets but considerable investment in magnetic equipment is required.

Some of the clips have to be arranged to lift the inner bottom assembly and turn it over and the top surface has to be provided with attachments to lift it to place. Once the assembly is placed all connection to the shell with the exception of the center girder and the ends of the floors under the margin plate is by intermittent welding and is done by hand. When the large units are assembled the finish weld of the inner bottom butt is made by machine.

At the end of each inner bottom assembly a solid floor is fitted with a top flange which serves as a backing strip. The athwartship top seam is welded by machine and the two edges of the backing strip are fillet welded underneath by overhead welding.

A better method is to put the inner bottom plating athwartship butt between two floors. Make a light pass overhead manual weld from the under side and complete the weld by machine on top. This avoids subsequent fatigue corrosion of the inner bottom plating near the backing strip.

To save time a light pass down hand manual weld can be run in the bottom of the "V". The butt is cleaned of all flux and slag by gouging and chipping and finish welded on top by machine. The overhead finish weld on the bottom is then made without holding back the other work.

Tee Flanges

Where shapes consisting of a web with a flange on the edge like frames, brackets, beams, and stiffeners have to be made up it is always best from a welding point of view to make them in the form of a tee because the tee flange can be laid flat and the web tacked in place vertically. A fillet weld is made simultaneously on both sides with a duplex welding head.

Where a member is curved it is awkward to support if the welding heads run on a platform to which the tee flange is attached. If the welding heads are suspended from above, the carriage is raised and lowered to follow the work.

In contrast if an "angle flange" is welded to the web, the web is laid flat and the angle flange tacked to the edge. Before it can be welded by machine a light pass manual weld has to be run down hand in the bottom of the "V", or on the back if the flange is straight.

However, curvature of the web plate presents no difficulty as the welding head runs on a horizontal surface of the web plate. The curvature is lateral instead of vertical.

Where two members one of which has a tee flange and one an angle flange come together the tee flange has to be carried on to the plating. See the lower margin bracket of the frame. By making models and testing to destruction it was found that (if the tee flange was not carried through) the welding of the web to the side plating tore away in every case.

Side Framing

All the side framing in the ship is cut to shape from plates. The inner edge has a flange welded on forming a large angle. At the sections where there is considerable curvature the webs of the frames will be cut and welded to save material. This does away with the expensive use of the furnace for bending frames.

The bracket to the margin plate will be cut to shape and the Tee flange welded on by a duplex machine head or by the machine making a fillet weld on each side separately.

The frame web, 4″ standing flange and the margin bracket will be assembled on the flat and a light pass manual weld made in the bottom of the "V" followed by a machine weld. At the junction of the margin bracket flange and the side frame flange where the machine is at a disadvantage the weld is made by the Thermit process or by manual welding. The frame is then turned over and the light finish weld is made by machine on the other side.

The 3″ x 4″ x ⅜″ clips are welded on to take the carriage bolts fastening the cargo battens. Another method is to slot the web of the frame and attach a hook bracket in the slot. A third method is to burn holes in the flange of the frame but the flange has to be made a little heavier to have this method accepted. The side stringers are put in and hand welded after the frames are erected.

Decks

The decks are welded into large assemblies that are convenient to be lifted. The size of the hatch that has been chosen for the C-3 ships is approximately 40 feet long and 24 feet wide. The hatch coaming and deck is welded into a unit on the welding table. The weight of the section of the deck 40 feet long including the hatch is about 50 tons and each additional beam space adds about 3 1/3 tons.

The plates are laid end to end and the butts welded as described under bottom plating. The edges are brought together and welded consecutively making a large sheet of deck plating.

The beam webs are laid flat to have the flange and the brackets welded on as described under frames. Another method is to burn off one flange of a channel with a hydrogen flame or order the flange sheared off at the mill and attach the brackets afterwards. They are then erected in place on the deck plating and welded by machine. The crowned deck will be raised at the side so the crowned deck beams will fit in place. See machine welded side plating for shrinkage.

The hatch coaming is laid face up and the half rounds welded on. The half round is welded to the horizontal hatch cover rest. The hatch coaming is turned over and the horizontal members above the deck welded to it. The bottom horizontal plate of the hatch girder is welded to the hatch coaming by making a light pass manual weld in the bottom of the "V" and finishing with a machine weld.

The hatch coaming assembly is brought into place on the inboard beam brackets. The end of the beam brackets are manually welded to the outboard side of the coaming and the fillet weld of the deck to the hatch coaming is made by hand.

The deck assembly is turned over, and the attachment of the deck to the hatch coaming and the finish weld of the deck seams and butts are made by machine.

The vertical brackets above the deck—the attachment of the beam brackets to the lower plate of the hatch girder—and the intercostals between the beam brackets at the hatch girder are welded manually.

The deck assembly section is lifted to place in the ship—the erection clips put on the outboard beam brackets and temporary stanchions put under the hatch coaming. The deck is then adjusted for height and width and the beams tack welded to the frames.

Where the flanges of the frames and the beam brackets come together refractory molds are fitted and all flange welds made simultaneously by the Thermit process. The multiple pass manual method is used to weld the bracket plate of the beam bracket to the frame. See Side Plating, Manual welded frames for work to be done before the frames can finally be welded.

The assembly butt of the deck has either an overhead manual weld or a down hand weld in the bottom of the "V" followed by a machine weld on top. An overhead manual weld on the under side finishes the down hand manual weld.

Stanchions

The stanchions shown are 20″ outside diameter and 1⅜″ thick made of two thicknesses and three plates in the round machine welded. These can be of large O. D. pipe but the pipe has to be ordered and made at the factory at higher cost than they can be made at the shipyard. If the stanchions are made of structural shapes there is no saving in weight for a column of the height shown.

Side Plating—Manual Welded Frames

The side plating is laid off on the model to segregate the various forms. Amidships there is a large section that can be made as a plane surface—another at the bilge as part of a cylinder—another at the bilge quarter length of the vessel as an approximate cylinder or side of a cone.

About 110 lineal feet of the flat side plating weighs about 50 tons, a suitable lift for two cranes. The plates are laid butt to butt and welded on the yard platform. Then the strakes are placed edge to edge and welded into a large sheet as described under bottom plating. The upper edge is left with some material for trimming and fairing.

The assembly clips are welded on and the large sheet hoisted to place. The upper deck attachment to the shell can be welded by machine after the initial hand weld is made and with some provision for procedure the other decks can be welded in part.

The frames may be welded to the side plating with staggered or chain intermittent welds but preferably by means of a light pass manual weld on each side.

The frames are spaced 2′-6″ centers and the webs are ½″ thick. The side plating is a little over ⅝″ thick. Ordinarily the rules call for chain or staggered ⅜″ fillet welds 3″ long 12″ centers against the side plating. There is a growing prejudice against intermittent welding on account of the flux and slag deposit at each end of the 3″ welds.

The intermittent welding gives an attachment area of 2.25 square inches per lineal foot of frame. If a 3/16″ continuous fillet weld on each side of the frame is used the attachment area is 4.5 square inches per lineal foot. For a ¼″ continuous fillet weld on each side of the frame the attachment area is 6 square inches. In a riveted ship using ⅞″ rivets 6 diameters centers the attachment area of metal is 1.38 square inches.

Obviously, properly made 3/16″ continuous fillet welds are ample, in fact if it were not for the difficulty of getting welders to make them, ⅛″ continuous fillet welds would be perfectly satisfactory.

After the side plating is attached in place, horseshoe strongbacks are placed over the frames and the ends welded to the plating. A wedge is driven between the yoke of the horseshoe and the flange of the frame. The toe of the frame should be held a few thousands of an inch away from the side plating by a gib headed fin gauge to relieve as much as possible the buckle that forms as the fillets cool. The vertical movement of the frames is taken care of as the frame slides in the horseshoes. The tack welds are broken and the welding proceeds from the bottom up.

In 100 feet there are 40 frames. Two 3/16″ fillet welds to the side plating makes ⅜″ of weld per frame. Forty frames at ⅜″=15″ of weld metal in 100 feet. 5% of 15″=.75″ shrinkage provided the work is done by top flight welders. Two ¼″ fillet welds per frame gives 1″ shrinkage using the same coefficient.

In shipyard welding a section should be laid up and the shrinkage coefficient observed for the particular welders. It will run as high as 6.25% in some cases or 25% greater.

After the coefficient is determined every group of two or three frames is moved 1/6″ plus or minus to take up the fore and aft shrinkage of the side plating beginning at a bulkhead and working both ways to the end of the section.

When the frames are welded the side plating buckles are corrected by heating and cooling before finally welding the decks in position. After the sections are welded the butts between are cut to length, beveled both ways from the half thickness of the plate and welded from each side equally using multiple passes.

Side Plating, Machine Welded Frames

The purpose of using machine welding to attach the frames to the side plating is to avoid the laborious hand welding job and to do away to a great extent with the buckling of the plates.

One frame and its lower end bracket plus the plating between two frames weigh about 2 tons. Twelve frames together with the side plating weighs 24 tons and makes up into a section 30 feet long. This is about as large a section that is practical to handle as will be seen later.

The three decks and the inner bottom have slightly different shrinkage coefficients due to the difference in proportion of weld penetration to the thickness of the plate. The welding machine makes a 3/16″ fillet on each side of the beam web plates in each case but the thick plating of the weather deck will not have as much shrinkage as the thinner plating of the other decks and the inner bottom. The final correction is made at the end of each section assembly so while the length of the ship as a whole is the same in each case the bracket of the beam that is attached to the frame at any one deck may not be in correct fore and aft position to register with the frame at that deck position.

A batten is lifted from the various decks giving the exact distances of the brackets from a fixed datum line.

The side plating is laid down and welded into a large sheet as described for bottom plating. The frame lines are laid off on the plating but the shrinkage as determined from the shrinkage coefficient is added to the actual length of the battens each frame or group of two or three frames being moved to bring them in register with the various decks and the inner bottom. The frames will not be in a true plane throughout their height but must be kept in a true athwartship plane at the inner bottom and the places where the decks intersect. Otherwise they will not register with the double bottom floors and the deck beam brackets.

Where the vessel is straight sided amidships or the width is narrow as at the bow no difficulty should be experienced. The cost of mocking up the plating and getting the frames true for the other parts of the ship would more than offset any gain in time or quality of work that would accrue.

In 30 feet there are 12 frames. Two 3/16″ fillet welds to the side plating makes ⅜″ of weld metal per frame. 12 frames at ⅜″=4.5″ of weld metal total. 12.5% of 4.5″=.56″ shrinkage if the work is done by machine.

If shrinkage allowance calculations are to be made by using averages the total shrinkage of each end of the section from the center must be kept to about half the thickness of the bracket plates. Otherwise greater or less shrinkage will cause the frame to miss the beam bracket too much to get a proper landing for the weld.

Sound and Radio Aids to Navigation

(Continued from page 31)

turned at a farther distance, due to upper favorable wind bending the sound wave downward again from the upper levels. While the range of the signal traveling against the wind is always reduced, this reduction is variable with winds of equal velocity, and it would appear that the variation may be due to the difference in the homogeneity of the transmitting medium at any given time. Since changes in temperature are frequently accompanied by changes in density, it is apparent that the variation in temperature between the signal and the observer will greatly affect reception of the signal, due to the bending and distortion of the sound waves by passing through such non-homogeneous medium.

Humidity and Fog

General observation shows clearly the increase of audibility range under conditions of fog. This is doubtless due to a homogeneous atmosphere and the possible effect of humidity in lowering the temperature and in reducing or checking air currents and eddies, which refract and reflect sound waves. A body of dry air between a signal and an observer would tend effectually to blank out the sound signal, which, however, is restored as soon as the humidity becomes uniform.

Location of Signals

For long range audibility, it is theoretically desirable to have a sound signal unit at a sufficient elevation to prevent a sound shadow within the range of audibility, due to the earth's curvature. However, for the usual audibility ranges for fog signals, different elevations have had little effect on ranges, as shown by tests in the United States.

The location of the signal unit should be selected with a view to freedom from interference of buildings, trees, hills or structures close to the signal. Such objects may produce sound shadows at certain distances, although the signal may be heard again at greater distances by the natural spreading or closing in of the sound waves.

Sound Signal Limitations

A sound signal must always be regarded as only an auxiliary aid to navigation which cannot at all times be relied upon. In thick weather it is desirable to stop the ship to reduce ship water noises and local noises on board to enable the sound of a needed fog signal to be picked up. Sound attenuation in a windy atmosphere is considerable, due to wind eddies near the earth's surface. Offshore winds are not as favorable as winds from seaward, due to non-homogeneity of atmospheric temperature and irregularity of wind eddy structure. Sound vagaries due to silent zones and reflected sound waves giving a false direction as to the bearing of the source of the signal dictate caution in the use of sound signals. These considerations led governmental authorities to research in the development of radio aids to navigation early in the history of radio development.

(Page 53, please)

New Round-the-World

President Steamers Leaving on Maiden Voyages Every Sixty Days

The new round-the-world liners are coming through on schedule. President Jackson, number one of this program of seven fine steamers, was delivered on the 25th day of October, 1940, arrived in San Francisco on November 18, and is now well around the world on her first scheduled voyage, being due to leave San Francisco on March 7 on her second round-the-world cruise. A complete illustrated description of this ship was published in the December, 1940, issue of Pacific Marine Review.

On January 17, 1941, the second of these ships cleared from San Francisco on her maiden voyage, having been delivered on December 19, 1940. The illustrations herewith are from photographs of that ship.

The balance of the seven ships are coming along on the following delivery dates:

President Hayes	February 20, 1941
President Garfield	April 10, 1941
President Adams	June 10, 1941
President Van Buren	August 12, 1941
President Polk	October 10, 1941

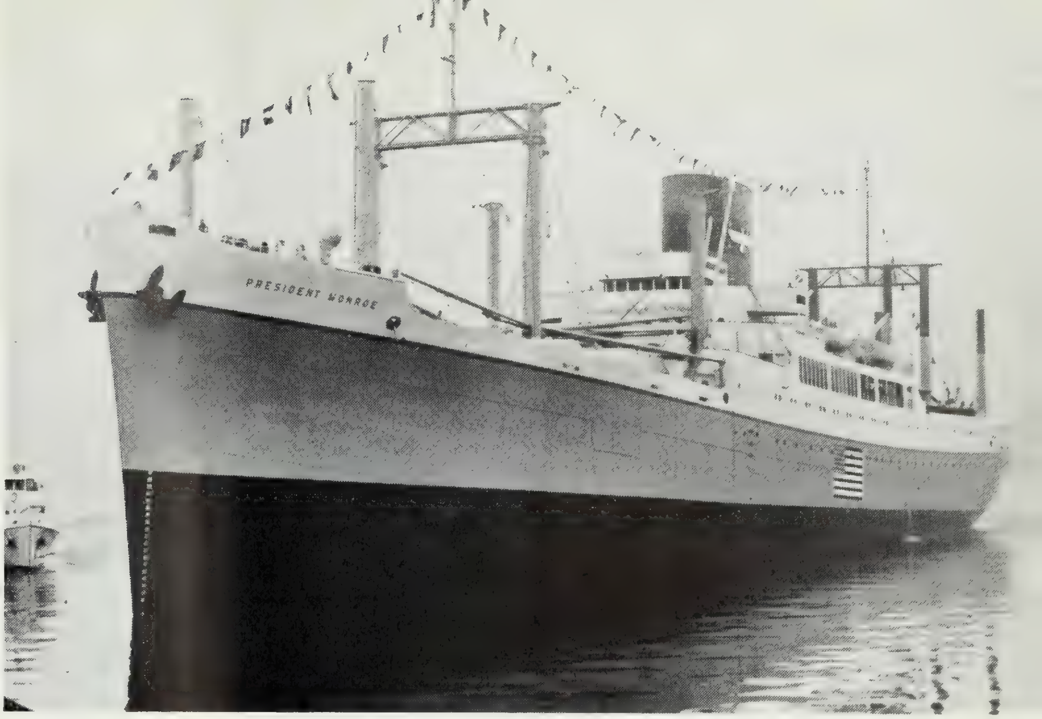
These ships are standard C-3 cargo liners of Maritime Commission design adapted for the transport of 96 first-class passengers. They are all being built by the Newport News Shipbuilding and Dry Dock Company. The adaptation, interior decoration and arrangement design is, we understand, due to the combined efforts of George Sharp, N.A., the technical staff of the shipyard, and the operating staff of the American President Lines. They are all to be congratulated on a magnificent job that has produced a delightfully comfortable and convenient country club afloat. This atmosphere is enhanced by the smooth operation. We had the pleasure of a ride from Los Angeles to San Francisco on one of these ships, and we have never been carried on any vehicle afloat or ashore with so complete absence of any sense of machinery in motion.

The hull demonstrated a nice easy roll in a seaway that promised comfort to passengers on the long legs of the round-the-world voyage. The complete and efficient air conditioning of the dining room, which is the only passenger compartment without outside exposure, is another factor of comfort, and, combined with the well-nigh-perfect control of refrigeration in the ship stores compartment, gives assurance of fresh, tasty menus in an atmosphere encouraging to hearty appetite.

We predict that these will be popular ships.

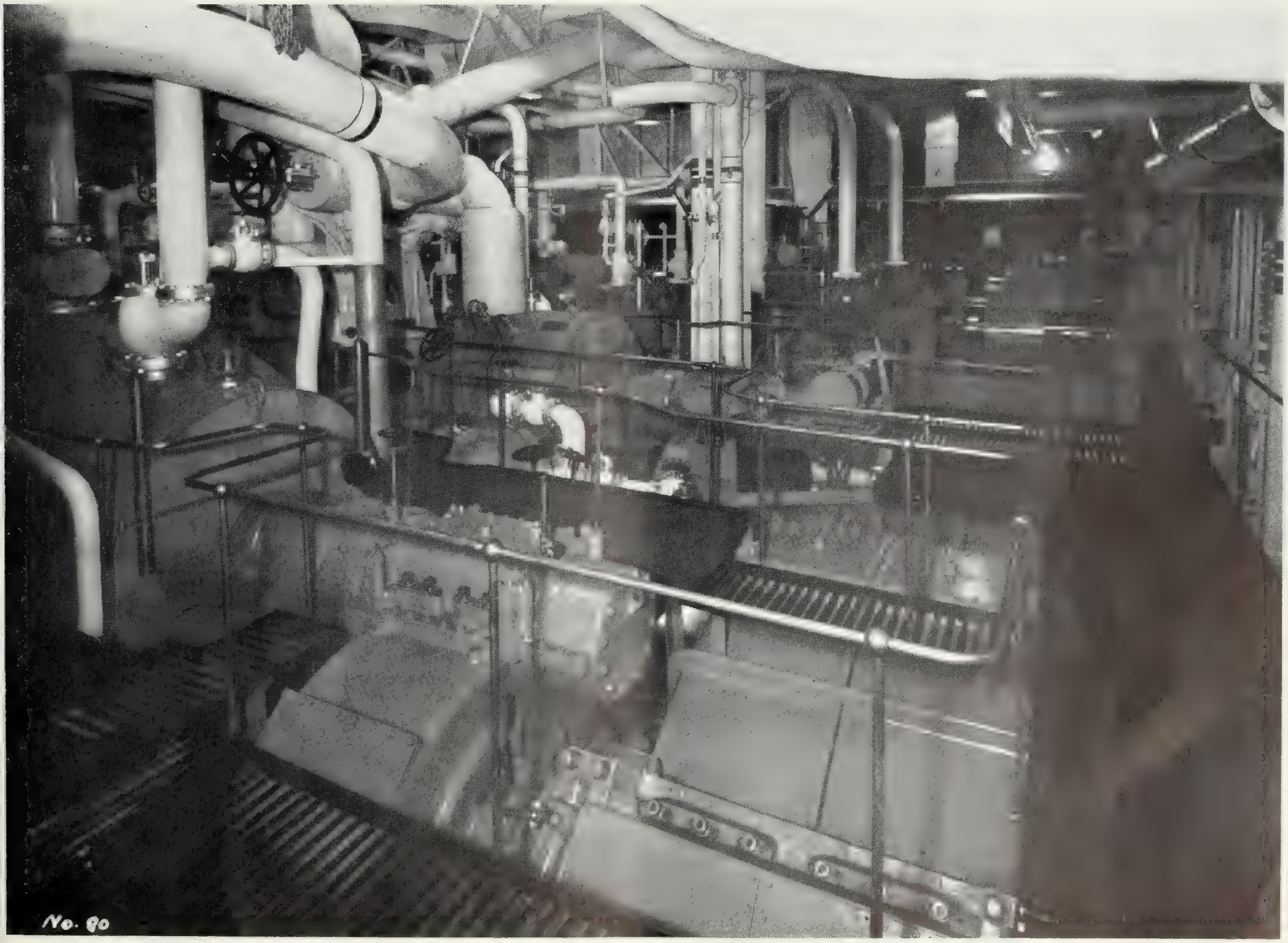
The dining room on a round-the-world liner

Liners



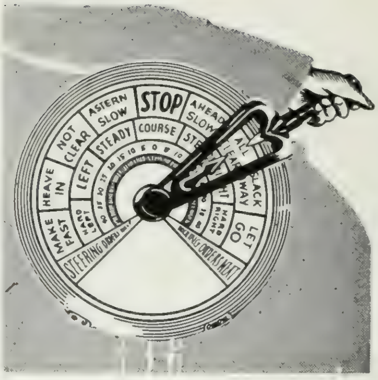
↑ *Quartering view of round-the-world liner President Monroe*

↓ *Engine room of President Monroe*



Steady as you go!

KNOWLEDGE IS THE STRAIGHT COURSE TO ADVANCEMENT



A Department for Deck Officers

by "The Skipper"

Questions Welcomed. Just Address "The Skipper," Pacific Marine Review, 500 Sansome Street, San Francisco, California

CARGO AND STOWAGE VIII

QUESTION

Why are rolls of paper usually stowed on end and what special stowage are they given?

ANSWER

Paper is made from vegetable matter reduced to pulp, such as wood, esparto grass, straw, flax refuse, jute, also rags. It is usually shipped in rolls, though it may be packed in bales and cases, in which event it may be stowed as ordinary general cargo according to the method of packing, taking particular care against dampness and chafing. When shipped in rolls, paper must be stowed on end to avoid distortion from the true cylindrical form by pressure from above which, if it occurred, would involve considerable loss of both paper and of time as the rolls would revolve eccentrically when in position on the printing presses. In some cases, the ends of the rolls are protected by circular discs of wood; in other cases they are simply wrapped with thick paper with extra layers over the ends.

All stanchions, ladders, etc., should be well covered with burlap to avoid chafage and dunnaging should be thorough throughout.

It is essential that the ground tier be stowed on a firm level floor, otherwise the bottom rolls will get badly distorted and claims for damage due to improper stowage will likely follow. In the end holds, the greatest care should be exercised to ensure that the platform on which the lower tier of rolls is stowed is both level and firm. When a full cargo of paper is carried, the most satisfactory way of doing that is by building a platform consisting of a series of steps, the width of which is to suit the diameter of the larger rolls, the platform to be resting on well constructed bearers.

NOTE: As announced by "The Skipper" in the January issue of Pacific Marine Review, a Civil Service examination for Assistant Inspector of Hulls was held January 28, 1941. The interesting feature of this examination was the radical change in the system of questions. Approximately 115 questions were asked. Along with each question, about five probable answers were given, the candidate being allowed one of the five to answer the question. In fact it was quite similar to the system of true and false questions being given by the Cadet trainers of the Maritime Commission to their Cadets. No sketches were required. Four problems were given on stability of which, one was finding block coefficient, one finding prismatic coefficient, one finding metacentric height and one by the trapezoidal rule.

When mixed cargoes are carried, the floor can be leveled off up to the turn of bilge by other suitable cargo, such as, clean, dry lumber which is particularly useful for this purpose.

Small rolls about 21″ in height, usually termed "cheese rolls" on the Pacific Coast, are frequently carried, and they make very useful beam fillings.

The use of cargo hooks, crow or pinch bars must on no account be used either for handling or lifting, and care should be taken that the edges are not damaged by coming in contact with hatch coamings or other obstructions when loading or discharging.

Soft rope slings should be used for slinging paper rolls. Rubber tubing, has in some instances, been fitted over the rope to avoid tearing the paper, and with excellent results. Loading or discharging of paper rolls by swinging derricks should not be resorted to owing to the difficulty of keeping rolls from banging against hatch coamings, ship's side, etc., which tends to destroy their shape, to avoid which is most essential.

QUESTION

How and what care is given the stowage of pipes?

ANSWER

There are such a large number of different kinds of pipes that it is almost impossible to lay down definite and concise rules regarding their stowage without making quite a long article on these particular goods. Cast iron pipes are generally shipped singly and have to be carefully stowed, first of all because they are so liable to breakage, and secondly because they occupy such a large amount of space in comparison to their weight.

Cast iron pipes of about 6″ diameter and upwards with flanges, should be stowed fore and aft with wood laid underneath athwartships of sufficient height to keep the bell or flange clear on the lower tier. The tier above should be reversed, so that the bell is clear and stowed in the cantline of the tier below; reversing the bell or flange in the following tier, and so on the whole way up in the hold. On no account should these pipes be stowed athwartships, as in event of one end getting hung up in any way, breakage is bound to occur. Where a large quantity of cast iron pipes are shipped of varying sizes it is then often possible to "nest" them, that is to say put the smaller ones inside the larger, and so save considerable space. As these cast iron pipes are usually shipped unprotected they require very careful handling.

Wrought iron pipes, such as gas pipes, etc., are shipped singly and in bundles; and must be stowed according to their size, weight and method of packing, but in all cases they must be stowed carefully on an even bed, preferably fore and aft, and great care must be taken to avoid bending, as large claims are continually arising from this cause.

Oil well casing moves in large quantities from Philadelphia to Los Angeles and is the source of many large damage claims. Extreme care in handling and stowage is necessary as the casing must be true to within a fraction of an inch. The proper way to load and discharge oil well casing with minimum damage is to sling it in drafts with the sling about 5 feet from the coupling end. This will prevent couplings from swinging and striking the coamings or being landed on the couplings, either on the dock or on the ship. In order to properly accomplish discharge of this cargo in this manner the casing must of course be loaded in tiers, each tier having the collars toward the hatch. In loading, the protector ends are landed first, and the collar end allowed to remain under the hatch, so that when discharging it is not necessary to drag the collar end, but it is lifted straight up through the hatch, and if any dragging has to be done it comes on the end that has the protector on it. The collars must all be one way. Use wooden buffers when dragging to protect pipe underneath. Another most important feature is the judicious use of dunnage. For instance, a carload of 3″ casing was discharged a short time ago with all pieces slightly sagged. Investigation showed that dunnage was used at both ends and none in the middle. The weight of the top cargo thereby caused the sagging which, while not more than ½″ out of alignment, nevertheless involved rejects and large claims. Dunnage should be laid freely and evenly. With small dimension casing top stowage is essential. The ends of the pipe must not be allowed to project for if they do and cargo rests on top, bends may be figured as a certainty. Oil pipe casing is very greasy and heat causes melting, so watch this feature with adjacent cargo. Do not allow stevedores to use hooks, for if they do, the chances are they will place a hook point in the threaded ends of the pipe and thereby burr the edges, also another instance of rejects. Separate car loads in the hold by the use of paint.

QUESTION

What special care is given the handling and stowage of plywood?

ANSWER

Plywood is made by joining together three or more layers of thin wood similar to veneer, in large sheets so placed that the grain of each layer lies in the opposite direction to that above and below, the whole making a very light pliable and strong sheet of wood. It was formerly used for fretwork, but is now made in varying kinds and used for paneling, furniture, and many other purposes. It is shipped largely from the Baltic, packed into bundles and bales, with a rough piece of wood on each side held together with bands, and sometimes in cases. Plywood should be handled with meticulous care and when loading, defective pieces should not be accepted. The dunnage used must be covered with paper, and athwartship stowage is preferred. Care should be used in marking off this commodity.

After loading and stowage has been completed, cover the lot with paper to prevent dust and debris from drifting on to the wood. Upper 'tween deck stowage should be avoided. Do not overstow with any granular matter and keep clear of wakes of ventilators.

QUESTION

What is the reason for rags being such an objectionable cargo?

ANSWER

Usually rags are packed in bales with the scantiest of covering and poorly bound together. In such cases the bales will not stand ordinary handling with the result that difficulty is experienced with consignees who, holding bills of lading for a number of bales, very naturally refuse to accept delivery of a quantity of loose rags.

Care should be exercised when accepting these bales if from a port where there is a liability of their being infected with plague or cholera, as the great objection to these packages is that they may convey contagion and vermin from port to port, and in some cases are only landed after much formality and great difficulty. Most countries insist upon the production of a Sanitary Certificate before rags are permitted to be landed so that, in such cases, if a certificate properly endorsed has not been obtained before shipment, the ship may be involved in much loss of time and money. They are peculiarly liable to spontaneous combustion, probaly due to carelessness in permitting oily material to be included in the bales, the detection of which by ship's officers is practically impossible, and cases have been known where the presence in bales of celluloid articles has added to the difficulty of extinguishing the fire.

Rags should never be stowed near oil or greasy articles, being liable to spontaneous combustion; and should be given stowage in the square of a hatch away from articles of an edible nature and delicate cargo.

QUESTION

How would you stow railroad iron?

ANSWER

Pillars in the hold should have wooden battens placed between them and the rails. Good heavy pieces of timber should be placed vertically at the ship's side, and the whole mass wedged up tight.

In stowing a large shipment of railroad iron, consideration must be given to the amount to be stowed in order that it may be distributed over the ship, having regard to the matter of trim and making the vessel easy in a seaway.

The loading should be so arranged that when all is stowed a level surface is presented right across the hold. Athwartships planks should be laid on top of the rails, and the hold filled up with other cargo solidly stowed. If the hold cannot be filled, the iron must be securely "tommed down" from the deck beams above it.

Stow railroad iron (rails) and other steel, as close as possible. Chock it against shifting and place dunnage between tiers for greater ease in passing the chain slings in hoisting out. In loading a full cargo of steel, put one-third in the 'tween decks. This cargo is best stowed fore and aft. The stowage and securing of this cargo calls for a considerable supply of timber.

QUESTION

What is the advantage of using rattans as dunnage and why are they useful for filling hatchways on completion of loading when carried as cargo?

ANSWER

Rattans are long flexible stems of an Indian plant usually known in Europe as canes, and used for many purposes such as basket making, mats, chair bottoms, and furniture. The inferior kinds are often used as dunnage and broken stowage.

The coarser grade may safely be used for dunnage under fine cargo, and, as rattan absorbs moisture, they are particularly useful for that purpose with pepper, sago, tapioca, sago-flour, and other commodities in bags which are liable to heat.

White rattan, however, should not be used as dunnage except with cargo that will not sweat, and only then if the bill of lading does not prohibit their use for this purpose. If wetted by rain, rattan should be rejected, because when stowed in that condition they will become badly marked and depreciate in value, resulting in damage claims.

The coarser grade rattan may be stowed almost with any cargo, even on top of jelatong with good dunnage between.

Both classes of rattan are very suitable for filling hatchways on completion of loading; loosely packed, they readily permit the heated air from the holds to pass through and so escape when hatches are open. With that object in view, a sufficient quantity of suitable length and grade rattan should be reserved to complete the loading of each hatch.

QUESTION

What precautions should be taken when loading rice?

ANSWER

Rice is extensively grown in most countries of Asia, Africa and America between Latitudes 45 degrees North and 38 degrees South and is always shipped in bags.

The method of stowing rice is similar to stowing any other cereal which is carried in bags, except that, owing to the large percentage of water it contains, and its liability to sweat, greater care must be taken as regards stowage and ventilation.

In stowing a cargo of rice, it is essential to see that the holds are perfectly clean and well dried, and that there is no water remaining in corners, of stringers, etc., or in the bilges. Floors should be well dunnaged, but the dunnage should not be laid too close together, so as to admit of a passage of air between the pieces of wood.

Great care is necessary when taking on board bamboos, dunnage, mats, etc., for a rice cargo. Bamboos are often brought down in rafts, and after lying in the sun for a few days are placed on board for dunnage. While they appear dry on casual observation, in realty they may be very wet, and not in a fit condition for use with a cargo of rice, therefore care should be exercised when receiving them. The same precaution should be taken to see that the mats are perfectly dry, and no rush or grass mats should be used; nothing but dry bamboo mats. All stanchions, etc., should be covered with soft bamboo mats.

The ventilation for rice is very important, as rice when stowed closely together gives off a very dangerous gas known as Carbonic Acid Gas, and an elaborate system is used to prevent an accumulation of this gas and also to prevent the holds from sweating.

The ventilating passages which are built in as the cargo is being loaded are usually made of two planks of wood kept about 9″ apart by small pieces of wood. They are laid athwartships from side to side and fore and aft from bulkhead to bulkhead on top of a tier of bags. The space between these air passages is five bags wide, both athwartships and fore and aft, and they are placed at every third tier from the bottom to the top of the hold. These horizontal ventilators are connected together by vertical shafts, which are in their turn connected to the permanent ventilators on deck. In addition to all this the side battens and bulkheads have to be covered with a lattice work of bamboos and the top tier of bags must have about 6″ or 7″ clearance below the deck beams, so that the whole cargo is, as near the practicable, surrounded by an air space.

A new system of stowage, called trenching has recently been introduced. This consists of dividing the cargo transversely at the center of the hatch by an air space or trench about one foot in width exending the full depth of hold, similar trenches being arranged at end bulkheads.

All longitudinal ventilators are led to these trenches, and the vertical ventilators in the center of the hatch, which are responsible for a large number of torn bags, dispensed with. The trench system increases the stowage factor from 3 to 4 per cent, according to size and type of ship.

QUESTION

How would you stow rubber latex and crude rubber?

ANSWER

Latex can only be handled on board slings using great care to avoid splitting of seams of containers. Do not stack too high. Under no circumstance stow adjacent to scupper drains. If the latex reaches

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Privilege and Responsibility

by Daniel S. Ring

Director Division of Maritime Personnel,
U. S. Maritime Commission

There are very few places in the world today where men may sit down in freedom to work out their own destinies. Except in a few scattered instances, their destinies are worked out for them by other men who have secured through deception and artifice the control of the governments under which those men live.

It is unnecessary to say that here, where men still retain the God-given rights described in our basic organic law, there is a need for the greatest of vigilance to prevent a debacle paralleling that of citizens in the totalitarian states. But, just as surely as the sun rises in the East and sets in the West, the same tragedy will happen here if those who have the rights of free speech and of free labor and free assembly fail to accept and discharge the responsibilities which such rights bring with them.

These responsibilities are directly linked with the duties attending any status in life. A failure to perform the duties entrusted to us by reason of our position in society will produce, first, a disintegration of our society, and, second, a change in the status of all members thereof.

You, above all of the groups in this country, should most deeply understand this, for with you, especially in your work aboard ships, the word authority takes on a real and tangible significance. Licensed officers, under the master, are the instruments of authority at sea. Unlike supervisory forces in any other industry, they are not merely supervisors representing employers, but men who, through their licenses and their positions, hold a commission as officers of government.

Ashore, the factory or the plant is directed by supervisory forces who are solely and wholly the representatives of employers. Law and order is preserved by the local authorities to whom the Government has entrusted these duties. At sea, however, both of these functions are merged in the supervisory personnel. The result is that a licensed officer is charged not only with the duty of supervising the performance of work as a representative of the employer but also with maintaining law and order on shipboard as a representative of the government, which a ship must have as soon as it departs from the jurisdiction of shore authorities. It must be recognized that each function of the licensed officer is equally important, equally essential to the welfare of the merchant marine—the function from the purely employment angle and the function from the governmental angle. Unless we recognize this fact, we may well find the very basis for orderly existence on shipboard being washed down the scuppers. At the risk of being redundant, therefore, I again emphasize that it is the duty of a licensed officer, as the representative of his employer, to see to it that the work of his subordinates is properly performed, and that it is an equally important duty of a licensed officer, as a representative of orderly government, to see to it that his subordinates are trustworthy, and loyal to the government under whose flag the ship sails.

Need For Authority

Let's look more closely into the need for authority among men. Ever since the first faint advances of civilization, it has been the setting-up and the recognition of authority which has been the basis on which civilization existed.

Ashore, it is inconceivable for a group of men to live together without the existence of some sort of authority. The authority ashore, which operates to preserve peace and good order, generally is vested in persons other than the employer of labor.

At sea, then, where there is no separate local authority at the beck and call of those needing its protection to preserve law and order, the fact that there is an ever-present common hazard, which must always be kept at a minimum, makes it especially important that authority of superiors must be recognized.

Listen to these clarion words of Andrew Furuseth, and ponder on the emphasis that present conditions and perils place on them today:

"**Remember that under the American flag you are a free man.** Remember that with freedom comes responsibility. Remember always, that at sea you are an individual part of the crew of the vessel. Remember, that at sea, you are under the law arising from the common danger—'the common hazard.' This commands self-sacrifice and the duty to obey all lawful orders, to do it promptly and efficiently. Upon this depends the safety of the vessel, the safety of the passengers, the cargo and the crew—your shipmates and your own.

"In a safe harbor you are under the law of freedom. Your body belongs to yourself. The estimate in which we are held by our fellow men depends mostly upon the use we make of that, which is admittedly our own.

"When we shall have learned to do our duty at sea, and to nobly use our freedom in port, we shall have earned and shall receive the respect of our fellow men."

Subversive Elements

There is a very serious and pressing situation in our merchant marine. No doubt all of you have heard, and many of you know, of elements who are going to sea whose interests are diametrically opposed to the interests of the sort of democracy under which we live. From one end of the country to the other have come demands for purges, remedies by the scores have been presented to the Government for ridding the merchant marine of those elements whose first interests are identical with the interests of totalitarian powers. These remedies suggest everything from militarizing the merchant marine to the creation of an OGPU which will ferret out subversive elements.

When all these panaceas were pouring into Washington to save the merchant marine from subversive activity, a group of those familiar with the problems of the

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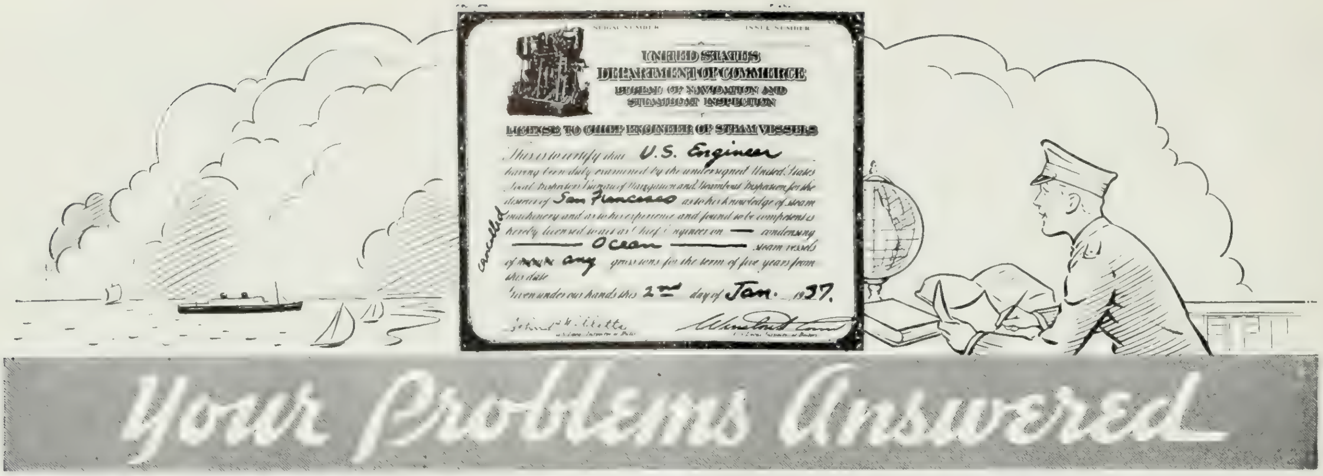

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MARINE BOILERS

XII—RATINGS

The rating or capacity of boilers has long been the subject of discussions and standardization attempts. A brief historical sketch of the subject may be of interest. Like any machine or unit made in different sizes and kinds, there should be some well-understood method of stating a size and capacity.

QUESTION

When and how did the term "Boiler Horsepower" come into use?

ANSWER

In the early days, boilers were rated in horsepower, both marine and stationary. The principal reason was that they were required to supply steam to an engine of specified horsepower. This practice continues today in many smaller stationary plants.

As designers learned to build better and more efficient boilers, the users found that they could get more than the nominal rating from them. It was customary to overload boilers as much as 400 per cent or more, and competition soon made it popular to sell boilers for high overloads, and there was no real connection between the boiler horsepower and the size of the engine.

QUESTION

Why was a B.H.P. formerly 30 lbs. of steam per hour and is now even more? Why shouldn't it be much less, as modern engines develop a H.P. hr. on 10 or less lbs. of steam?

ANSWER

In 1876 engineers attempted their first standardization, and agreed that:

(a) The real determination of boiler capacity was its ability to make steam expressed in pounds of water feed to it or delivered as steam per hour.

(b) The ordinary engine in use at the time took about 30 pounds of steam per horsepower hour or per horsepower per hour, H.P. Hr.

(c) Therefore the standard and accepted boiler H.P. would represent the ability to deliver 30 lbs. of steam per hour at the then standard condition of 100° F. feed water temperature and 70 pounds gage steam pressure.

The A.S.M.E. (American Society of Mechanical Engineers) adopted this as code standard in 1889.

In order to use this standard with boilers of higher pressure and different feed temperature, it was necessary to apply a factor of evaporation to this figure of 30 lbs. per H.P. per hr.

A general understanding has since existed in which the boiler H.P. shall be the equivalent capacity to evaporate water at 212° F. into steam at 212° F., thus adding 970.4 B.T.U. per pound to the water. In other words, the boiler shall be rated in its ability to absorb heat from the flame expressed as British thermal units, B.t.u., but instead of using this huge number as a rating, it is expressed in H.P., with the knowledge that the boiler H.P. would be used to represent the same number of B.t.u. as the original definition of boiler H.P.

The B.t.u. content of the original definition was, of course, calculated as follows:

Seventy lbs. gage is 84.4 lbs. absolute. From steam table, we find that 1 lb. of steam contains 1183.5 B.t.u. The B.t.u. in the feed water at 100° F. would be 100—32=68 B.t.u. 1183.5—68=1115.5 B.t.u., and this multiplied by 30 is 33,465.0 B.t.u. per boiler H.P.

The standard* conditions to which all other conditions are readily referred is 212° F. feed water and 212° F. steam.

QUESTION

What is the present steam rate for one B.H.P.?

ANSWER

In standard conditions, the standard B.H.P. would contain the same number of B.t.u. but would represent a different number of pounds of steam, calculated as follows:

33,465.0 B.t.u. divided by 970.4 B.t.u. gives 34.465, or generally taken as 34.5 pounds of steam per H.P. per hour evaporated from and at 212° F. Note that 970.4 is the heat of vaporization of steam at atmospheric pressure of 14.7 pounds per sq. in. absolute.

Therefore, whenever the term H.P. or boiler horsepower is applied to steam generation, it means evaporating steam at a rate 33,465 B.t.u. per H. P. or 34.4 lbs. of water at standard condition of from and at 212° F.

This does not mean that the boiler under consideration is actually operated at

212° F. steam to determine its H.P., but that its B.t.u. rate is the same as a hypothetical boiler operating at standard condition.

QUESTION

Is the B.H.P. used much with modern marine boilers?

ANSWER

No. The most satisfactory way to remember the boiler H.P. is ability to transfer 33,465 B.t.u. per hr. Also the use of H.P. in boiler rating has practically passed out of the marine picture, and is not used in the larger stationary jobs.

The modern method of rating a boiler is to express its capacity in terms of water evaporated at the specified condition, and frequently the equivalent B.t.u. capacity is expressed which will be the difference in heat content per pound between the steam and the water multiplied by the number of pounds of steam evaporated per hour.

Even the term "Boiler" has fallen into disuse, and modern ships are equipped with "steam generators." The capacity of the steam generator is not referred to so much as the capacity of the engines in H.P. Steam generators are designed for a specific application.

QUESTION

Is the size of a boiler expressed differently from its capacity?

ANSWER

The size of a steam generator is often referred to in terms of square feet of heat transfer surface. This is a logical reference, and has nothing to do with capacity or rating. It only indicates to some extent the size of the unit. The same size unit may have twice the steaming capacity if other fuel or forced draft is used.

Frequently we hear the figure given for evaporation per square foot, an attempt to tie together the size and capacity. A very common figure is 10 lbs. of steam per hour per square foot. This figure has little comparative meaning, as it may be high or low, depending on many conditions not specified. Modern steam generators may go to 30 or 40 lbs. of steam per sq. foot. yet the figure cannot be used as a comparison. The entire steam plant has so many possibilities of variation and is so complex that there really is no figure or even set of figures by which a comparison of one steam generator may be made with another. The whole system must be compared.

This, then, leaves us in a very unsatisfactory position as regards ratings of steam generators, and raises many questions.

QUESTION

If the output can be increased by increasing fuel burned, what determines the point where normal load will be established; and why have overload ratings?

ANSWER

Like all machines, as we increase the load some one factor fails first, leaving all other factors with additional capacity. For instance, on trials a new ship will be fired to determine ultimate speed and power. Usually it is some minor unit which limits the plant, such as the feed pump will supply no more feed, or the breechings get too hot, or we get excessive smoke showing limit in draft. If we then decide to improve or enlarge the unit which limited the plant, then a limit is soon reached in another unit.

Overload capacity is desirable, however, for several reasons. Horsepower required will increase in bad weather or with a foul bottom, or occasionally much can be saved by an extra half knot for 24 hours. Thus plants are so fitted out that the so-called normal rating will come at the point of best or highest efficiency. Additional load can be carried, but at an increase in fuel per shaft horsepower hour (shp hr.). The increased fuel rate may cause some smoke, we may have to run the standby auxiliaries or some such penalty, and the stack temperature will go up above a reasonable value; perhaps the vacuum will fall a half-inch.

In the same way, the engines are fitted for an overload at a loss in efficiency, such as opening up overload valves, bypassing to lower stages or other means of increasing power.

A good illustration of what can be done in increasing output if efficiency is not a factor is the reversing wheel on the main turbines. Here is one single wheel, perhap two, with 3 or 4 rows of blades, which will develop 80 per cent of the horsepower developed by all the wheels in the ahead sections of the turbine. But when we realize that this 80 per cent of normal horsepower requires full load steam from the boilers, we can understand why we use the weight and size of the ahead sections. It is to get this normal 100 per cent horsepower at a reasonable or normal steam rate.

Thus we see that the normal or 100 per cent rating of the various units is taken as the output at about their best efficiency, which usually leaves some overload margin.

It is customary and good practice to let the overload limit be determined by the main turbines, in that they will pass no more steam with the overload valves open and steam pressure up to normal.

Some limits in steam generators as load is increased are:

(a) Priming or foaming, or excessive water carried into superheaters and lowering superheat. This will carry the sediment and suspended matter in water, over and through superheaters, scaling them; but more serious is the dust they make in the steam, which may settle on turbine blading as a scale.

(b) Excessive temperature of superheaters.

(c) Smoke and soot, or fire in the breaching from excessive C.O. (carbon monoxide).

(d) Excessive furnace temperature; damage to refractory.

(e) Lack of sufficient water circulation, steam pockets in tubes, blown tubes.

(f) Steam pressure drop.

(g) Fuel oil burners or heaters will not handle any more fuel, or fail to atomize.

(h) Draft limits, about same as (c) above.

(i) Stack temperature too high.

(j) Boiling and water hammer in economizer.

(k) Limits in auxiliaries or controls.

QUESTION

What is the factor of evaporation as referred to steam generators?

ANSWER

This term and factor is not in general use today, because the actual B.t.u. output or steam per hour as specified conditions are given. The factor of evaporation is a ratio by which the heat delivery of one unit may be compared to another of different steam and feed conditions.

970.4 is the B.t.u. delivered to one pound of steam at 212° F. and from 212° F. water, i.e., the latent heat of steam at 14.7 lb. abs.

If we compute the heat delivery per pound of water by taking the difference in the heat content of one pound of feed water, h, and one pound of steam, H_1, and divide by 970.4, we have the factor of evaporation; thus $F = \frac{H_1 - h}{970.4}$.

The factor for 100° F. feed and 250 lbs. gage is 1.1690. This means that for this condition the boiler adds 16.9 per cent more heat to the steam than under standard conditions of from and at 212° F.

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*The term "conditions" means the temperature of feed and temperature, pressure and superheat, if any, of the steam.

The War
AND INTERCOASTAL SHIPPING

by G. H. Helmbold

Director of Operations and Traffic, U. S. Maritime Commission

On September 1, 1939, the dry cargo vessels in the intercoastal fleet numbered 171, with a total deadweight tonnage of 1,627,632. As of May 15, 1940, the total was 114 vessels, aggregating 1,100,647 deadweight tons. The difference of 57 vessels, with 526,985 deadweight tons, constitutes decreases of approximately one-third.

The various intercoastal steamship operators have reported that on October 1, 1940, there were 122 vessels in the dry cargo trade, totaling 1,121,360 deadweight tons. On January 20 of this year, according to information supplied by these same operators, there were 127 vessels in operation, the tonnage not being available. However, the significant thing is that with less vessels in the intercoastal trade in 1940, the dry cargo carried exceeded that transported in 1939, as will be shown hereunder.

Volume of Intercoastal Dry Cargo

The official statistics of the Maritime Commission show that the average annual movement of dry cargo commodities via intercoastal vessels for the fifteen-year period from 1924 to 1938, inclusive, totaled 5,589,527 long tons, the eastbound tonnage being approximately 60 per cent of this amount.

In 1939 there was a total of 6,170,464 long tons, of which the eastbound cargo was slightly less than 58 per cent.

Based on a monthly average for the first eleven months of 1940, the combined east and westbound dry cargo for 1940 will aggregate 6,181.321, or 10,857 tons in excess of 1939. The eastbound cargo constituted 58.5 per cent, and represented an increase of about 43,000 tons.

As may be observed from the preceding data, intercoastal traffic moves predominantly eastbound. From the standpoint of volume, lumber is the most important single commodity entering into the eastbound movement. In the period from 1936 through 1939 it comprised between 30 and 34 per cent of the total, but in 1940 lumber accounted for 48 per cent of the total movement.

According to statistics supplied by the Industrial Facts Department of the West Coast Lumbermen's Association, intercoastal lumber shipments aggregated 1,075,999,000 board feet in the first eleven months of 1939 and 1,109,800,000 board feet for the same period in 1940, the average monthly shipments being 97,818,000 and 100,891,000 board feet respectively. For the entire year of 1939, shipments averaged 98,345,000 board feet per month. Thus the monthly average of lumber shipments for the first eleven months of 1940 is a little over 3 per cent above that for the identical period in the year 1939.

Since the intercoastal traffic is predominantly eastbound, it is of interest to examine the utilization of vessel space in connection with the movement in this direction. Based on data supplied by the intercoastal steamship operators, it was estimated, in connection with the eastbound movement, that about 80.5 per cent of the total available bale cubic was utilized in 1939 and about 91.3 per cent in 1940. The higher space utilization in 1940 than in 1939 indicates that the lesser number of vessels in operation in 1940 resulted in the carriage of heavier loadings, a condition which did not prevail in 1939 because the intercoastal routes were over-tonnaged. These figures do not comprehend the traffic carried by intercoastal vessels to and from the Caribbean area. If this traffic were included, the space utilization would be approximately 100 per cent, i.e., the available cargo space would be found to have been used to the full capacity during 1940.

Reasons for Unsatisfactory Position of the Intercoastal Steamship Companies

The generally unsatisfactory position of the lines in the intercoastal trade during the period from the close of the last war to the beginning of the present conflict, insofar as earnings and the ability of the companies to replace their rapidly-aging fleets are concerned, has resulted from a number of major factors, one of the most important of which has been the over-tonnaged condition of the trade.

With few exceptions, there have been practically no vessels constructed for the intercoastal trade subsequent to the completion of the Government's war-built fleet. This has resulted in part from the fact that operators in this trade were able to acquire vessels from the Government at low costs. For example, in the period from January 1, 1922, to August 30, 1934, 71 vessels built during the war period at a cost of approximately $200 per ton were sold at an average price of $20.98 per ton. As a result, there was a fairly constant influx of war-built tonnage into the intercoastal trade, which until about 1923 had enjoyed fairly stable and remunerative rates. The introduction of these ships into the intercoastal trade led to over-tonnaging and resulted in rate wars and unstable conditions, which were further complicated by wide disparity in the capital costs of vessels acquired prior to and after 1922.

Many itineraries of the intercoastal lines include as many as a dozen ports of call. Perhaps the most efficient steamship operation is that comprising a single port of loading and a single port of discharge. In fact, I have had one prominent owner tell me that from a purely monetary standpoint he would prefer to load a full cargo at one port, and discharge it all at one port and bring his vessel all the way home in ballast, assuming a full homeward cargo were not available at the discharge port. The intercoastal operator who, in order to obtain cargo, must load up and down the coast and discharge it up and down the other coast is apt to be licked before he starts.

Operating expenses have advanced materially in recent years, due primarily to a substantial increase in the cost of handling cargo at terminals. Serious labor disputes, increasing competition from the railroads and trucks, and a narrowing of the margin between rail and water rates, all have added to the burden of the water lines, whose revenues have not kept pace with the rising costs of operation. Adding all of these factors together, we get the answer—insufficient revenue to pay for the cost of the service, including depreciation and a provision for replacements.

Direct Effect of the War on Intercoastal Services

When war broke out in September, 1939, there followed very closely a sharp demand for tonnage in the world market, and freight and charter rates started moving upward. Many vessels which could not be sold in the summer of 1939 for $10.00 per ton rose in value to $45.00 and $50.00 a ton. Vessels which could operate only at a loss in the domestic trades could make handsome profits in foreign trade. The war afforded to many American owners of vessels in the intercoastal trade an opportunity to dispose of their surplus vessels with capital gains, and to others an opportunity to liquidate their business and withdraw from the trade, eliminating or greatly reducing the deficits shown on their books.

The war, therefore, has had the effect of removing surplus vessels from the intercoastal trade, and at the same time strengthening the financial and competitive position of the operators remaining in the trade.

Government Assistance

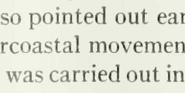
By virtue of the authority contained in Public Resolution No. 74, the Maritime Commission can offer its vessels for sale or charter under competitive bids for operation in the domestic trades until the Proclamation issued by the President in November, 1939, has been revoked. Assuming that vessels were available for such a purpose, I am not sure that the sale of these old vessels for the intercoastal trades is a sound proposition. Such sales would merely repeat what was done years ago, and what is thought by some to be one of the causes for the position of the intercoastal lines today. Such sales would merely place additional old vessels in the trade and would not improve the long-range position.

The chartering of old vessels by the Commission for these trades would tend to relieve any shortage of tonnage. Charterers could not, however, afford to pay world market rates. Furthermore, the Commission has no vessels in operating condition which could be offered for charter, and would have to spend about $175,000 or $200,000 for each vessel to place it in condition. It seems unlikely that a charterer could afford to pay a rate of hire which would reimburse the Government for the reconditioning cost, nor himself undertake to repair the vessels and amortize the repair cost within a reasonable time. If the Government, therefore, were to assume the cost, and at the same time accept a charter rate under the world market rate, we again would be confronted with the question of indirect subsidies. It may be recalled that in July, 1940, the Commission offered six of its old vessels for charter for operation in the domestic trade. The vessels were offered "as is, where is," for charter for a period of twenty months, with an obligation on the part of the charterer to place the vessels in condition to meet the requirements of the American Bureau of Shipping and to comply with the rules and regulations of the Bureau of Marine Inspection and Navigation, and with the option of renewal for a year and at an adjusted rate of hire. There were no bids received on the invitation.

Outlook for Immediate Future

As was pointed out earlier in this paper, the intercoastal operators today have in operation 127 cargo vessels. This represents an increase of five vessels over those which were reported in service on October 1 of last year.

As was also pointed out earlier, the increased intercoastal movement of lumber during 1940 was carried out in spite of the reduction in total available ship space as compared with 1939. The stocks of West Coast lumber on hand in wholesale yards in the North Atlantic territory on December 1, 1940, stood, in round figures, at 155 million board feet. While this was a substantial decline from the 271 million board feet in those yards on July 1, 1940, it is believed that, unless abnormal demands develop this spring in connection with national defense needs, the intercoastal fleet can, without serious inconvenience to the lumber and other industries, take care of shippers' needs if no further withdrawals of ships occur. There is no indication that the lines contemplate withdrawals in the near future, but there is indication that if additional vessels are needed, those vessels now owned by the intercoastal lines and chartered temporarily in the foreign trade will be available for return to intercoastal trade.



Should this reserve tonnage be inadequate to handle lumber shipments, the Maritime Commission will, of course, do all that it can, under existing law and in the light of other immediate needs for vessels, to help find a solution.

Conclusion

It seems to me that the intercoastal rate structure has developed on a basis unsound and uneconomic for permanency, due principally to the abnormally low cost at which most of the second-hand vessels were acquired after 1922, and the resultant complications. These low capital costs encouraged an excess of tonnage in a protected trade, with resultant severe and wasteful competition not only between the water carriers themselves but also between them and the railroads. Three very important steps to remedy the situation have already been taken, namely, removal of surplus tonnage in the trade, elimination of a large fleet of idle Government-owned vessels which has long hung like the sword of Damocles over the heads of the intercoastal operators as a threat of further competition, and elimination of the possibility of Government vessels being made available through sale at low prices for intercoastal operation.

The maintenance of an efficient intercoastal fleet will require a substantial number of new vessels. The present reserves of the intercoastal operators are inadequate to meet the capital requirements, and the present rate structure appears inadequate to support the high annual interest and depreciation charges on such vessels. In addition to these factors, there must be improvement in labor conditions; more efficient management, both as to ship and terminal operations; and better cooperation between, and coordination of, the various forms of transportation, including a readjustment of rates.

Pacific NORTHWEST MARINE REVIEW

by D. L. Pratt

Shipbuilding in Full Swing

Beginning soon after March 1st, the great shipbuilding program on Puget Sound will start going full blast for by that time the new five million dollar shipyard of the Seattle-Tacoma Shipbuilding Corp at Seattle will be completed, and at the time this is written it is hoped that the keel for the first of the 25 destroyers the company is building will then be laid. For some time steel has been arriving at the yard and work of laying out of templates and pattern steel indicates a starting signal for serious production. Meantime the Lake Washington Shipyard had already launched two of the big steel submarine net tenders it is building for the government, and the third of the four under contract was scheduled for launching about March 1st. This work goes on steadily in spite of the fact that the yard is being virtually remodeled and rebuilt under a $600,000 expansion program that will enable it to take care of present orders which include a contract from the Navy for six Seaplane Tenders. Work has also been under way for a month in the construction of the new shipyard for the Associated Shipbuilding Co. of Harbor Island. Several hundred men are at work and it is anticipated that the yard construction will not take long as the company already has on the site the two big graving docks that were used to construct the great concrete pontoons for the Lake Washington bridge and which are of more than ample size to handle the construction of the four big Seaplane Tenders which the company will build for the navy. The hulls will be erected two at a time. New construction will therefore consist mainly of offices, shop buildings, mold lofts, etc., and it is expected that the work will be far enough along to enable the yard to lay its first keel in May. When in operation it is expected that the company will employ upwards of 2500 men.

Portland Shipyard Speeded

As work goes on under full steam on Puget Sound, builders at Portland are also speeding the work on the Columbia River's biggest enterprise, the yard of the Oregon Shipbuilding Co. which is under contract with the Maritime Commission to build 32 cargo vessels. Engineers for the Gilpin and General Construction companies, yard contractors, have been making surveys and driving test piles preliminary to the actual construction of the big eight-way plant. Edgar F. Kaiser, vice-president and general manager of the shipbuilding organization, says the ways should be completed in about six months. "Mike" Miller, chief engineer for Consolidated Builders, Inc., at Grand Coulee Dam, will supervise the construction of the shipways. Charles Shea, Jr., son of Charles A. Shea, president of the new company, will be assistant to Kaiser. Offices of the two contractors, Gilpin Construction Co. and the General Construction Co., are in the Henry Bldg., at Portland.

Wood Craft Building

With the steel shipbuilding program now well set and under way, maritime interests on the Sound and the Columbia river are now turning their attention to the building of smaller craft for the Navy and the Coast Guard. Large appropriations have been made at Washington for this program and the Northwest builders, of whom there are a score or more in position to handle these orders, are eager to get their share. In order to better urge their claims for business and to get a better understanding of the program, the Pacific Northwest Boat-Builders and Allied Industries recently sent H. C. Han-

Mold loft of Plant No. 1, Seattle-Tacoma Shipbuilding Corporation

S. S. Yawata Maru of the N.Y.K. Line, built for the Japanese-European service with two sister ships, Nitta and Kasuga Maru. Yawata and Nitta are now in Pacific Coast-Yokohama service. Kasuga is not yet finished. They are 17,200 tons gross, 590 feet 6 inches length, 73 feet 8 inches beam, and have double-reduction geared turbines driving twin screws for a speed of 22.5 knots

son, well-known Seattle naval architect, to Washington to confer with Navy Department chiefs. One of the principal purposes was to determine whether facilities can be set up in the Thirteenth Naval district to issue specifications at the same time they are issued by the Navy Department at the capitol. Hanson has already reported that Pacific Coast yards will have an equal chance with other sections in sharing the heavy program, which includes the building of from 200 to 250 boats. He has also been advised that the Coast Guard will call for bids on both the Pacific and Atlantic simultaneously, and that West Coast woods and other products will be given full consideration as a result of the revision of specifications. Meantime the first contract for boats of the smaller class has been awarded to the N. J. Blanchard Boat Co. of Seattle, an order for three aircraft rescue boats at a total cost of $142.233. These boats, better known as "Crash Boats," will be 45 ft. long, 13 ft. beam, powered with twin 600 h. p. gasoline motors. Of the V-bottom design, they are expected to have a speed of 40 m.p.h. Northwest builders believe this is just the beginning of a flood of small wood and steel boats that will crowd the capacity of every one of the many yards both on Puget Sound and the Columbia River.

Big Yard Rumors

Considerable speculation was aroused by the disclosure that the Pacific Car & Foundry Co., at Renton, south end of Lake Washington, had taken an option six months ago on 22 acres of land for use as a possible shipyard. Paul Pigott, president of the company, declares, however, that there is nothing tangible about a shipyard plan. "In common with other industrial plants throughout the country," he stated, "we were asked about six months ago to make a report on the facilities we had for supplying the various national defense needs, and our possibilities for expanding them. We made such a report and included a discussion of the opportunities for shipbuilding at Renton, but no actual negotiations are pending." The Pacific Car & Foundry Co. recently received an order for a thousand new freight cars from the Union and Southern Pacific Railroads. Another proposition for a new yard at Seattle, at least novel in its conception, is involved in a bill which has just been introduced in the state legislature by Sen. Albert D. Rosellini of King County which would enable the city of Seattle to go into the shipbuilding business on its own account. It has been seconded by Sen. Geo. A. Lovejoy of the same county. The measure provides that a city council ordinance select the site for the shipyard, arrange the financing and select a commission to operate the business. It was believed that the plan would provide for revenue bonds, to be purchased by the Reconstruction Finance Corporation. The plan at least suggests a unique idea as to how the government might finance part of its shipbuilding program by borrowing the credit of the cities, the cities' credit, of course, to be bolstered by shouldering the final risk back on the government again. No one but a politician could figure that one out.

Small Boat Marina

With something over 18,000 boats registered, the second largest in the country, Puget Sound ports have almost a primary marine problem in providing suitable anchorage and moorage. An indication of this problem is shown in the recent acquisition by purchase of a 6 acre tract of waterfront on Portage Bay, an arm of Lake Union, by Motor Boat Marina, Inc. Jerry Bryant is president of the company, Latham Goble, vice-president, Dan Lundin, treasurer. This concern has occupied the quarters for several years and the decision to acquire it is an indication of the concern's increasing activities. From a small beginning in 1936, when Bryant decided to supplement his downtown outboard motor shop with a lakefront store, the operation has grown to its present size involving "dry storage" for more than 350 craft, ranging from small boats upward to 40 ft. cruisers. The area acquired includes five buildings. The "Marina, Inc.," is agent for the nationally known Chris-Craft type of boats and each year holds a motor boat show which last year was attended by about 20,000 people.

Dock Workers Busy

Indicating greater activity along the Seattle waterfront during 1940, waterfront employers show that they paid dock workers the first 11 months of last year $3,161,710.78, an increase over the same period in 1939 of $539,000. Since the first of the year activities have been tremendously increased, and at the present rate, this amount will probably be doubled. While much of this activity is accounted for by the government's huge defense program in Alaska, coastwise and foreign shipments have also shown an increase. Shipments to Vladivostok have been unusually heavy and shipping men say that lumber shipments out of Puget Sound for February will break all previous records for a twenty-eight-day period.

Gold Ship Will Aid Defense

Retired more than three years, the famous old Seattle-Alaska gold ship Victoria has been brought back into service and has been at the West Seattle moorings of the Alaska Steamship Co. being prepared for a new assignment. Staterooms are torn out, superstructure taken off and port holes sealed to fit the vessel as a freighter to carry supplies for the great airports and military bases which are being constructed in Alaska. The Victoria was built in Dumbarton, Scotland, in 1870, and for a time was operated as the Parthia, a Cunarder in the transatlantic service. She became most famous, however, during the Alaska gold rush and thousands of gold-seekers trod her decks and millions of dollars worth of yellow metal was stored in iron chests in her hold on her many trips between Seattle and Nome. For many years she was in command of the late Captain John A. ("Dynamite Johnny") O'Brien.

Lightship Repairs

Reconditioning of three ships in the Seattle district which the Coast Guard took over when its merger with the Lighthouse Service went into effect has been recommended by the House Appropriations Committee. Allowances cover $26,000 for the Umatilla Reef lightship, $40,000 for the Cutter Pulaski and $13,000 for the Swiftsure Bank lightship.

Two Year Ferry Pact

The Puget Sound Navigation Co. and the Inland Boatmen's Union have signed a new agreement raising wages and stabilizing hours and working conditions until Jan. 1, 1944. Ferries operating for the Black Ball Lines and the Ritsap County Transportation Co. will be free from strikes under this new pact for the longest time since 1934. The agreement is hailed with satisfaction, especially by the residents of the cross-Sound districts who have been seriously inconvenienced by two strikes in recent years. Under the pact, basic wages were increased to $110 and $115 a month, retroactive to Jan. 1st, and to $120 a month through 1943. Granted also, was an 8 hr. day, vacations with pay, closed shop and union hiring hall.

Alaska Sailing Schedules

Because of the speedup of defense activity in Alaska and the large increase in freight and passenger business,the Alaska Steamship Co. will post three sailings a week and cut out its former excursions to Southeastern Alaska via the Inside Passage. Focal point of the army and navy program is in southwestern Alaska, and so all steamers will operate on a 12-day excursion to that district, via the inside, calling particularly at Anchorage and Womens Bay. No calls will be made at Sitka but the calls at Skagway and Haines will be made once a week, both north and southbound. The Alaska Line will also set a new record in activity with 106 passenger sailings between Feb. 8th and Nov. 1st. These boats will combine freight and passengers both, but in addition there will be eight strictly freight boats swung into service during the spring, summer and fall months.

From Fourteen Nations

According to the Merchant'sExchange, ships from fourteen nations called at Seattle during the past year. A total of 1,617 deep-sea ships of 5,040,271 tons arrived and 1,628 ships of 5,060,000 tons departed. German ships are the only carriers of the major nations that do not appear in the list.

Kvichack Wrecked

Grounded after striking a rock in Queen Charlotte Sound, the former Alaska Packers' Association vessel Kvichack, now under charter as an army transport, sent out an "SOS" Jan. 27th and Coast Guard boats rushed to her rescue. Passengers were safely taken off and brought back to Seattle. The steamer, with main deck awash, and laying hard aground on the treacherous Sisters Rocks, 120 miles south of Prince Rupert, struck in heavy weather and her position is such that there is little hope for her salvage. She is a 1200 ton vessel 200 ft. in length. The Vancouver Tugboat Co. reports that the former five-masted sailing schooner K. V. Kruse, converted into a log barge, and missing in Hecate Strait since late in January, is also a total loss. She broke loose from the tugboat La Pointe in a storm and was carried ashore.

Personal Gleanings

After 32 years of service with the Matson Navigation Co. at Seattle, **S. Parker Rowell** has retired, and will live on his two-acre ranch at Lake Forest Park. . . **J. G. ("Giff") Euson** has been made traffic manager of the Seattle division of the Seattle-Tacoma Shipbuilding Co. Euson has been well-known as a shipping executive on the coast for a number of years. . . . **Chief Bos'n Herman Windeck,** in charge of the Willipa Harbor life-saving station for 30 years, retired from service Jan. 21st, and Coast Guard warrant officers gave a luncheon in his honor in Seattle . . . **Capt. G. B. Wait,** asst. mgr. of Alexander & Baldwin, agents for the Matson Line, is the new president of the Seattle Merchants' Exchange . . . **Kenneth D. McKenzie,** asst. genl. passenger agent of the Alaska Steamship Co., has answered the call to the colors. He is an army reserve officer with the rank of lieutenant. He was due to report in San Francisco Jan. 29th to the U. S. Army Transport Service at Fort Mason. . . American President Lines at Seattle, through **Hugh McKenzie,** vice president, announced the promotion of **Walter L. Johnson** to passenger traffic manager, of **E. L. Judson** as general passenger agent and of **Hubert McGowman,** one-time purser, as general passenger agent in charge of the company's Manila office.

Sabotage in Bridge Crash

Deliberate sabotage was expected as the cause of the crash of the 5,500 ton freighter Coast Miller into the Burnside bridge at Portland on February 1st. As a result of the crash, the vessel, with stacks and pilot house smashed and both masts broken off, had to go on drydock for extensive repairs. The vessel whistled for the draw, which failed to rise in time. Investigators found lack of power in the bridge engine room was responsible, and that two emergency switches that are always kept closed were open, one in the power plant of the east lift, the other in the west.

Sound and Radio Aids to Navigation

(Continued from page 39)

Development of Marine Radiobeacons

The development of the radiobeacon as a practical aid to navigation has been in progress for a considerable number of years. The French lighthouse service established regular rabiobeacons in 1912, but for various reasons these did not prove successful, and were abandoned. In the United States, the Bureau of Standards development of improved shipboard radio direction finders in 1915 and 1916 eventually resulted in the establishment of an experimental radiobeacon at Navesink Lighthouse, New Jersey, in 1917. In 1920 the first three regular radiobeacon establishments were made in the vicinity of New York harbor, and when they began regular operation in May, 1921, they became the first successful radiobeacons in the world to serve mariners regularly. The world total of such aids was 23 in 1924, 63 in 1927, 192 in 1931, and now there are an unknown number scattered throughout the world, and estimated to exceed 500. Concurrently, the number of radio direction finders installed on commercial ships was 291 in 1924, 702 in 1927, 3553 in 1930 and probably in excess of 10,000 by 1938. Today a radio direction finder is legally required on many classes of vessels, and is rapidly becoming almost standard navigating equipment on even the smaller pleasure craft.

Initially, all radiobeacons operated on a single frequency or wave length. As the number of radiobeacons increased they interfered with each other, and after a few years, by International Conference, a 30-kilocycle band of frequencies was reserved for marine radiobeacons within the limits 285 kilocycles and 315 kilocycles. This 30 kilocycle band of frequencies soon became inadequate, however, and in order to provide the number of radiobeacons needed to protect shipping in the waters of the United States, it became necessary to revise the radiobeacon system and to operate three radiobeacons on each available frequency. This was accomplished by providing a rather elaborate timing system, which synchronized all radiobeacons in the United States, and by providing automatic control, which permitted groups of three radiobeacons to share a given frequency by emitting signals each in sequence for one minute out of each three minutes. The Europeans subsequently adopted a similar system using a six-minute cycle, with each of three radio beacons transmitting two minutes in sequence for a six-minute cycle instead of the three-minute cycle of one-minute emissions used by the United States radiobeacons.

This simple means of sharing available radio frequencies is less convenient to the mariner than if all radiobeacons operated continuously, but it has made it possible to establish large numbers of radiobeacons which would not otherwise have been possible. No additional frequencies for radiobeacon purposes could be obtained, because of the limits of the usable radio spectrum and the demands made by the many public services, such as broadcast, ship communication, air transportation, military requirements and others. With the shared sequence system of operating radiobeacons, the development of this practical navigational aid has progressed to its present state.

In addition to operating the groups of signals in sequence on a single frequency, it has been necessary gradually to decrease the amount of frequency separation between groups in order to accommodate new aids from time to time. However, this means of providing space for new radiobeacons is largely limited by the character of the radio direction finder in use today on the average vessel. The instruments being currently installed on many vessels can readily separate radiobeacon signals only a few kilocycles apart, whereas the average instrument installed ten years ago has difficulty separating signals separated by one-half of the whole radiobeacon spectrum of 30 kilocycles.

In this connection it is well for navigators and those concerned with their problems to recognize that the sooner the radio direction finders purchased eight or ten years ago are replaced by modern instruments, the more readily it will be possible to establish the additional radiobeacons continually being demanded.

The cost of establishing new radiobeacons at existing lighthouses is relatively a much smaller problem than the provision of radio frequencies for the operation of new radiobeacons and so long as many old and relatively obsolete radio direction finders are in use on shipboard it will not be practicable to establish many of the new radiobeacons needed and desired by mariners. Many ship owners have found it to be possible to obtain from the original manufacturer of a radio direction finder a modernized radio receiver chassis which will considerably improve the selectivity of the instrument where it may be impractical to replace it entirely with modern equipment.

At present it is necessary to base the separation of radiobeacons on the average performance of radio direction finders installed about six years ago. Older instruments are incapable of making full use of the present-day radiobeacon system and it is not possible in establishing radiobeacon frequencies to take full advantage of the selectivity of present-day new equipment on shipboard until a sufficiently large number of vessels are equipped with such apparatus.

The most powerful sound-in-air fog signals, under very favorable conditions, may be heard at distances of 10 to 15 miles or more but their dependable range is not over 5 miles and under unfavorable conditions they are unheard at much shorter distances. The coast lights are visible for from 15 to 20 miles ordinarily and large lighted buoys about 10 miles. The primary radiobeacons have an equally reliable range of 200 miles and are unaffected by fog, rain, wind or snow. Thus, for one typical section of the Atlantic Coast where 98 sound-in-air fog signals serve approximately 4000 square miles, 19 radiobeacons in the same coastal area serve several hundred thousand square miles. The same length of coast line has about 160 major lights. The coastwise mariner can now remain well off shore out of range of all lights and sound signals and can still navigate with certainty and accuracy entirely by radio-

(Page 78, please)

Organizational, Expansion and Trade Notes

Caterpillar Appointments

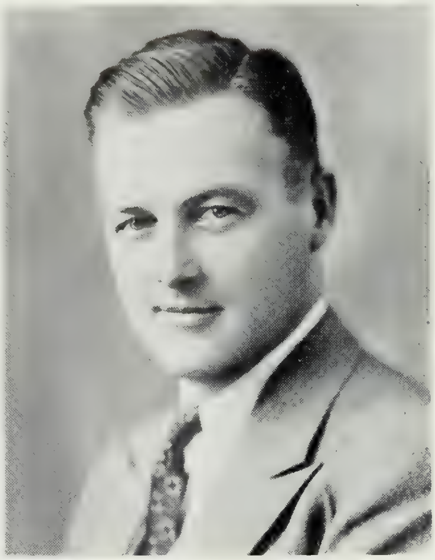
James H. Deaderick, who has been assistant sales manager of the Western sales division of Caterpillar Tractor Co. since 1939, has been appointed the company's assistant general parts manager.

Mr. Deaderick, whose headquarters have been at "Caterpillar's" San Leandro, California, offices, has been transferred to Peoria. In his new capacity, under the general managership of L. G. Morgan, Mr. Deaderick will have active charge of all general administrative activities in the Parts Department, as well as supervision of all Parts Depots. W. B. Gordon has been appointed parts manager in charge of physical inventory and its control; and A. H. Yingst, parts manager in charge of orders, invoicing and distributor contact.

Born in Santa Barbara, California, Mr. Deaderick attended grade and high schools there. He studied at the engineering school of the University of California until 1925, when he left college to engage in the contracting business.

In 1929 he entered the employ of Caterpillar Tractor Co. as a member of the service department at San Leandro. A year later he was sent to the Peoria Service Department. In September, 1933, he became assistant service manager, and returned to San Leandro in the following year as Western service manager. He held this position until his appointment as assistant sales manager of the Western division.

Young Engineer Highly Honored



James H. Deaderick, assistant general sales manager, Caterpillar Tractor Co.

Twenty-nine-year-old Jesse E. Hobson, who once aspired to be a teacher and "never did have any disire to tinker with radio sets or a home workshop," has just received the Eta Kappa Nu award as the country's outstanding young electrical engineer for the year 1940. A member of Westinghouse's engineering staff in East Pittsburgh, Pennsylvania, Dr. Hobson received the annual award at a dinner in conjunction with the AIEE winter convention in Philadelphia. Eta Kappa Nu is an honorary electrical engineering society affiliated with the AIEE.

Dr. Hobson has been with Westinghouse for three years; is now in charge of application work on electric power equipment for the Northwest District. Recognized as an able teacher, he has instructed at three different universities, organized lecture courses for his company, and published several technical papers on power systems.

As a boy on a farm in western Indiana, Dr. Hobson planned to teach history as a life's profession, but, because his father wanted him to become an engineer, he enrolled at Purdue University in 1928, graduated four years later at the head of his class in electrical engineering, still wondering if engineering would hold as much interest for him as history. His outstanding college record brought him a fellowship for another year of study at Purdue, and the degree of Master of Science. Two years at the California Institute of Technology on a Charles A. Coffin Foundation Fellowship gave him a doctor's degree, *magna cum laude,* for his research on high voltage.

After teaching for two years, he joined Westinghouse as a central station engineer; has been with them ever since.

Columbia to Expand

Columbia Steel Company, subsidiary of United States Steel Corporation, has announced the approval of a program for the enlargement of its Pacific Coast facilities so as to embrace additional steel making and finishing mills. Work on this program, which involves an expected expenditure of upward to $5,000,000, will commence in the near future.

The decision to build further facilities on the Pacific Coast is a recognition of the growing steel demands of that region coming from manufacturers engaged in supplying directly and indirectly the needs of the National Defense Program as well as from other users of steel products.

The Columbia Steel Company, which was acquired by the United States Steel Corporation in 1930, is a fully integrated company owning and operating steel works at Pittsburg and Torrance, California; ore and coal mines and a blast furnace in Utah; open hearth furnaces, rolling wire, nail, sheet and tin mills, foundries and wire rope and fence plant.

Westinghouse to Build in San Francisco

Purchase of land on which Westinghouse plans to erect a new building in San Francisco was announced on January 30, by Charles A. Dostal, Pacific Coast District manager for the company, and R. J. Holtermann, vice president of the Westinghouse Electric Supply Co. The total investment in land and building is expected to exceed $300,000.

The land, located on the southwest corner of Eighth and Bryant Streets, was purchased from the Dominican College of San Rafael, through Buckbee Thorne & Company. The L-shaped lot has a frontage of 275 feet on Eighth Street, and is 275 feet in depth at its deepest point. It extends to property of the Western Pacific, where it is served by spur tracks. It comprises approximately 59,000 square feet.

Now in the planning stage, the building probably will include more than 100,000 square feet of floor space. It will enable consolidation under one roof of all Westinghouse and subsidiary companies activities in San Francisco.

The decision to buy land and erect a new building in San Francisco reflects the confidence of the company and its subsidiary groups in the business and industrial future of the San Francisco area—in fact, in the entire Pacific Coast. This city is headquarters for Westinghouse activities and operations in the entire Pacific Coast District. This district comprises all of seven Western states, plus central and western Montana, western Wyoming, southwestern New Mexico, and El Paso County, Texas.

Westinghouse's total investment in the District—buildings, raw materials and finished stocks—exceeds $6,000,000, and the firm employs more than 1,300 persons. The business is growing—proof enough of the wisdom of the company's policy of expansion in the West. Last year, Pacific Coast District business was almost 50 per cent greater than in 1939.

Consolidation of all Westinghouse San Francisco activities in the new building will make for greater efficiency of operation and better service to customers. The new building will house all activities of all departments of the Westinghouse Electric & Manufacturing Co.; the Westinghouse Electric Supply Co.; the Westinghouse Lamp, X-Ray and Merchandising Divisions; the Westinghouse Electric Elevator Co.; and the Bryant Electric Co. Warehouse facilities, garage and parking space will be provided.

It is expected that plans will be completed and building will be started in 1941.

Manufacturing, assembling and servicing activities carried on by the company at its Emeryville, California, plant and service department will not be affected by the San Francisco consolidation. At Emeryville, the company manufactures all types of low- and high-voltage porcelain insulators; transformers, motors, electric water heaters, capacitors and electric panelboards and switchboards. Service department facilities there are adequate to handle virtually all electrical apparatus from fractional horsepower motors to large steam turbines which power naval or merchant vessels.

Export to India Via Cape of Good Hope

The centuries-old trade route to India by way of the Cape of Good Hope has become one of the busiest runs of the American Merchant Marine.

This was disclosed recently in figures released by W. S. Dausey, freight traffic manager of American Export Lines. Mr. Dausey announced that American Export ships in the India service, during the first year of operation in this service, carried average cargoes of between 6,000 and 7,000 weight tons. These cargoes have been carried over the old Cape of Good Hope route since Italy's entrance into the war closed the Mediterranean.

American Export inaugurated its India service December 3, 1939, when the S. S. Excelsior sailed from New York for Calcutta, by way of Bombay, Karachi, Colombo, Madras, and Rangoon.

At that time the Mediterranean was still open. The adoption of the India service was a natural expansion from the Mediterranean and Black Sea services which American Export had operated for years. The Excelsior and three other motor ships, which American Export purchased from the United States Maritime Commission, were placed in the service.

Italy's entrance into the war, however, put an end to the Mediterranean and Black Sea services and closed the Suez. It meant that the American Export ships had to round the Cape to reach their destination. And it meant that the India service became the most important single branch of American Export's activities. The New York to Bombay run via Suez is 8169 miles, via Cape of Good Hope the distance is 11,390 miles.

Meanwhile American Export was well into its $30,000,000 shipbuilding program. Seven new ships of the Exporter type, noted for their speed of more than 19 knots, have been placed in the India service. One more has been launched and will be in service early in the summer.

These modern ships, noted for their speed, have made it possible to tighten up the schedule and give a maximum of dependability. The Exporter ships have been given fast schedules and have been able to adhere to them faithfully.

War conditions have had a considerable influence in boosting demand for the India service. Rangoon, one of the ports of call, is the clearing point for all cargoes into and out of China—the shipping end of the Burma road.

Extension of United States credits to China has resulted in a large movement of Chinese goods out of this port, and a correspondingly large flow of American-made goods into this port.

In addition, England's war-time status has meant that India, which usually relied on England for steel and other raw materials and manufactured goods, has turned to the United States as a source of supply. Steel shipments have been particularly strong.

In return for the exports carried to the Orient in this fashion, American Export Liners bring a number of imports which are considered vital to the defense program in the United States, either directly or indirectly. Among these are rubber, manganese, mica, tungsten, hemp, tung oil, cotton, shellac, burlap and jute.

On the export side of the picture, American Export's principal outward-bound cargoes in the India service are steel, automobiles and trucks, machinery, lubricating oil, chemicals, cooperage stock, printing and wrapping paper, and a wide assortment of general cargo.

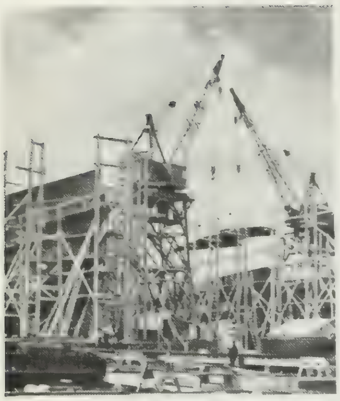
New Paint for Corrosive Conditions

A new grade of Koroseal paint, named "Koroplate," developed to protect metal surfaces against chemical reactions and recommended for service wherever extremely corrosive conditions disqualify any other kind of paint or coating, is announced by The B. F. Goodrich Company, Akron, Ohio.

Base of the paint is Koroseal, a synthetic material created in the Goodrich laboratories from polyvinyl chloride, which is derived by a series of chemical reactions from the common materials coke, limestone and salt.

The new paint is liquid at room temperatures, and requires no heating before application. At ordinary temperatures it can be either brushed or sprayed, and can be thinned with either brush or spray thinners when necessary. It is made only in semi-glossy black.

It must be used in conjunction with a Koroseal primer with similar characteristics.



On the Ways—
SHIPS IN THE MAKING

LATEST NEWS FROM AMERICAN SHIPYARDS

Loans for Coastwise Ship Construction

The United States Maritime Commission announced on January 30 authorization for issuance to Irving Trust Company, New York City, of commitments to insure preferred ship mortgages aggregating $6,300,000, or such part thereof as does not exceed 75 per cent of the construction cost of each of three single-screw, steam turbine tankers being constructed by the Sun Shipbuilding & Dry Dock Company, Chester, Pennsylvania.

The three bulk oil carriers will be built for the account of companies closely identified with Charles Kurz of Philadelphia, Pennsylvania, president of the Pennsylvania Shipping Company and an operator of tank vessels.

The commitments to insure are made under Title XI of the Merchant Marine Act, 1936, as amended, providing for Maritime Commission insurance of mortgages on new vessels. It brings commitments under that Title to $7,625,000.

The three tankers are expected to be completed during the summer of 1942. They will be of 16,400 deadweight tons each, and were designed primarily for operation in coastwise and intercoastal trade.

The first, to be owned by Kaymar Tankers, Inc., a subsidiary of Keystone Tankship Corporation, will include National Defense features financed by the Maritime Commission to the extent of $300,800, and has a designed speed of 16½ knots.

The other two, to be owned by Keystone Tankship Corp., are of a design similar to the first, except that the speed will be 15½ knots and no National Defense contribution will be made. However, the latter two will be capable of ready conversion into naval auxiliaries.

The two 15½-knot vessels are being built to replace the S.S. Seakay and S.S. Markay, two of the twelve twin-screw, National Defense tankers built by the Commission in cooperation with the Standard Oil Company of New Jersey. They were purchased by and have been operated by the Kurz organization. The Seakay was recently acquired by the Navy and renamed the U.S.S. Santee. The Navy is scheduled to acquire the Markay shortly.

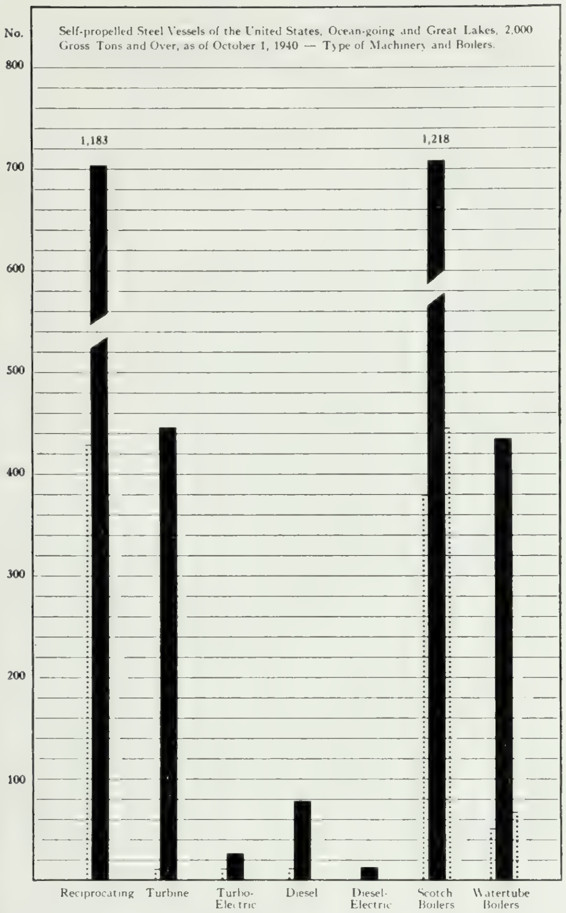
Participation of the Irving Trust Company in the financing of these three vessels is indicative of an increasing interest by larger financial institutions in the Federal Mortgage Insurance provisions of Title XI of the Merchant Marine Act, 1936.

SEAGOING STEEL MERCHANT VESSELS OF 2,000 GROSS TONS AND OVER COMPLETED EACH MONTH DURING 1940 IN UNITED STATES SHIPYARDS

Month	No.	Gross Tons	Horsepower	Passenger			Cargo			Tanker		
				No.	G.T.	H.P.	No.	G.T.	H.P.	No.	G.T.	H.P.
January	4	28,741	32,140	—	--		2	15,080	15,500	2	13,661	16,640
February	2	14,831	15,400	—	—	—	2	14,831	15,400	—	—	—
March	4	30,139	26,550	—	—	—	3	21,953	22,550	1	8,186	4,000
April	5	41,597	51,150	—	—	—	4	30,281	35,950	1	11,316	15,200
May	4	31,744	35,650	1	7,977	8,600	3	23,767	27,050	—	—	—
June	4	54,731	64,900	1	26,454	37,400	—	—	—	3	28,277	27,500
July	7	55,724	51,946	-	—	—	5	36,411	42,616	2	19,313	9,330
August	3	22,666	21,400	1	7,987	8,600	1	6,736	8,800	1	7,943	4,000
September	2	19,089	24,550	—	—	—	1	7,773	9,350	1	11,316	15,200
October	6	49,746	48,750	1	9,273	9,350	4	29,236	31,900	1	11,237	7,500
November	5	39,031	31,216	1	7,997	8,600	3	19,679	15,116	1	11,355	7,500
December	7	56,664	56,110	1	9,273	9,350	3	21,487	18,150	3	25,904	28,610
Total	53	444,703	459,762	6	68,961	81,900	31	227,234	242,382	16	148,508	135,480
1939												
Total	28	241,052	248,430	3	30,063	30,000	14	91,560	93,200	11	119,429	125,230

Western Pipe Gets Two C-3 Steamers

The Maritime Commission announced January 31 an award of contract for construction of two C-3 type, single screw, steam propelled cargo vessels to Western Pipe & Steel Company, San Francisco, California, on its adjusted price bid of $2,990,000 each, submitted August 6, 1940.



Graph showing type of machinery on American Merchant Marine. Dotted line is Great Lakes

(Courtesy American Bureau of Shipping)

It Pays to Use

"NIKELADIUM ALLOY" Steel FLANGED FITTINGS

Manufactured to A.S.A. Standards B16E—1939
Steel Specification ASTM A157-C1

Manufactured of Carbon Moly Steel with tensile strength of *90,000 lbs. per square inch.* Tested to three times the stated working pressure —metal thickness from ¼" to ½" over specifications.

NIKELADIUM ALLOY *Steel Flanged Fittings* are made to meet A.P.I., Marine, Steam and various other standards. Fittings made to order in ASTM A157-C11 or Corrosion Resistant Steels.

Christmas Tree Fittings, Return Headers and *Return Bends* made in *any* analyses.

SPECIFY NIKELADIUM AND GET THE BEST

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LOS ANGELES STEEL CASTING COMPANY

Send for Complete Stock List

2444 SO. ALAMEDA STREET LOS ANGELES, CALIFORNIA

FLANGE FITTINGS for Every INSTALLATION

A previous award was made on August 29, 1940 to this company for construction of four C-3 cargo vessels under the same bid.

This brings to 190 the number of vessels built or building under the Maritime Commission long-range construction program.

* * *

Commission Contracts for New Shipyards

The Maritime Commission announced on February 6 clearance with the National Defense Advisory Commission and award of two contracts for construction of 10 ways and other shipbuilding facilities involving an estimated government investment of $6,462,500. The contracts were:

Alabama Dry Dock & Shipbuilding Co., Mobile, Ala., 4 ways, estimated cost $1,322,500.

North Carolina Shipbuilding Co., Wilmington, N. C., 6 ways, estimated cost, $5,140,000.

Age of Self-propelled Steel Merchant Vessels of the United States, Ocean-going and Great Lakes, 2,000 Gross Tons and Over, Exclusive of Philippine Islands and Government Service Vessels, Compared to the Rest of the World.

	United States-Oct. 1, 1940				Rest of the World July 1, 1939*	
	Ocean-going		Great Lakes			
Age	No.	Percent	No.	Percent	No.	Percent
Under 5 years	101	7.8	6	1.3	1,367	15.6
5 to 10 years	38	2.9	0	0.	863	9.9
10 to 15 years	56	4.3	28	6.4	1,565	17.9
15 to 20 years	175	13.4	27	6.2	1,884	21.5
20 to 25 years	770	59.0	39	8.9	1,282	14.7
25 years and over	164	12.6	339	77.2	1,781	20.4
Totals	1,304	100	439	100	8,742	100

Age of United States Merchant Fleet as to Type

	Ocean-going			Great Lakes		
	No.	Gross Tons	Average Age	No.	Gross Tons	Average Age
Passenger	153	1,155,692	19.9	15	60,996	30.8
Cargo	715	3,698,190	20.8	30	112,708	33.2
Tanker	354	2,610,966	17.1	9	33,768	14.5
Bulk Carrier	54	275,861	22.6	358	2,061,975	31.3
Ferry & Misc.	28	83,943	19.1	27	75,688	23.9
Totals	1,304	7,824,652	19.6	439	2,349,135	30.8

* Latest authentic compilation.

A very instructive tabulation, showing the need for even greater shipbuilding effort by the United States

(Courtesy American Bureau of Shipping)

SHIPBUILDERS and ENGINEERS

BUILDING WAYS FOR WOOD AND STEEL CONSTRUCTION

SAN FRANCISCO OFFICE *and* PLANT
Machine Shop and General Repairs
1100 SANSOME STREET
Telephone SUTTER 0221

G

ALAMEDA PLANT
Machinery, Hull and Industrial Repairs
TWO DRY DOCKS
3,000 tons and 5,000 tons capacity
FOOT OF SCHILLER STREET
Telephone ALAMEDA 8585

GENERAL ENGINEERING and DRY DOCK COMPANY

The shipyard facilities are to be used for construction of part of the 200 merchant ships called for by the President's emergency shipbuilding program reported to Congress on January 16. Plant facilities will be installed at cost.

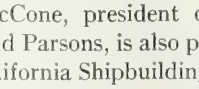
Three other contracts, providing for 22 ways and involving an estimated Government investment of $14,233,000, were announced on January 13, 1941. Contracts for construction of vessels will be made following final action on a joint Congressional resolution appropriating $313,500,000.

California Shipbuilding Corporation

On February 18 a five-year lease for an 86-acre tract on Terminal Island was concluded between the Los Angeles Harbor Department and the California Shipbuilding Corporation. This property has a 2500-foot frontage on the Cerritos Channel, which connects the East Basin of Los Angeles Harbor with the Long Beach inner harbor and separates Terminal Island from the mainland. The site has a width of 1500 feet from pierhead line to Dock Street, and is served by spurs from the Los Angeles and Salt Lake R. R. Cerritos Channel is maintained at 35-foot minimum depth, on a 400-foot width, with considerable width of shallower water and tidal flats on each side.

The ink was still wet on the lease while 400 men were started clearing the site. Eight shipbuilding ways will be built, and six outfitting piers.

John McCone, president of Bechtel McCone and Parsons, is also president of the new California Shipbuilding Corporation. Federal funds to the extent of $3,000,000 are to be expended in the building of the shipyard, and the corporation has a commitment to build there 31 of the U. S. Maritime Commission standardized cargo vessels at a cost approximating $50,000,000.



Isthmian to Buy Pacific-Built C-3's

Isthmian Steamship Company, subsidiary of United States Steel Corporation, has entered into a contract with the United States Maritime Commission for the purchase under the construction differential subsidy provision of the Merchant Marine Act of 1936 of eight C-3 type steam-driven turbine cargo vessels with a sustained sea speed of 16½ knots. The construction cost of these vessels will approximate $2,800,000 each. The vessels are scheduled for delivery during the first six months of 1942.

The C-3 ships, largest and fastest cargo ships built under the Maritime Commission program, are about 9,300 gross tons, with a cargo capacity of about 10,000 tons. Plans for the construction of these vessels have been approved by the Navy Department as being suitable for National Defense purposes.

Four of these ships are now being fabricated in the yards of the Seattle-Tacoma Shipbuilding Corporation, Seattle, Washington, and four in the yards of the Western Pipe and Steel Company, San Francisco.

Lessons From Casualties

Asphyxiation by $C\text{-}O_2$ from Cargo

Warnings about poisonous and strangulating gases have been issued on many previous occasions by the Bureau of Marine Inspection and Navigation and attention is once more called to the dangers of carbon dioxide. This gas is particularly dangerous because it is odorless, tasteless, and colorless. Cargoes which are known to generate it must be treated with the greatest possible care, and caution must be observed never to inhale the dangerous CO_2.

The danger of this gas was graphically and tragically illustrated in the case of the M. V. Empire State which was carrying a cargo of cherries from Albany to New York on November 24, 1936. In order to keep the cherries fresh "dry ice" had been packed into the hold and the hatches fastened. When the hatch covers were removed prior to unloading, the dry ice had, of course, evaporated, but the carbon-dioxide gas given off by the dry ice was present in deadly amounts, though, being odorless, colorless, and tasteless, it showed no sign of its presence. Being a heavy gas it had accumulated at the bottom of the hold. Four stevedores jumped into the hold to commence the unloading and met instant death. When the stevedores entered the hold, they almost immediately collapsed upon the top of the cherry containers, and were asphyxiated, as was a deckhand who went to their assistance. The second mate and two other stevedores who next went to their aid also collapsed and were resuscitated only after extensive treatment at a nearby hospital. Five men in all met their death.

The latest occurrence was in connection with a comparatively little-known cargo, castor pomace, carried on the S. S. Ellenor from New York to Tampa, and the purpose of this particular warning is to redirect attention to the handling of this or similar fruit byproduct. All persons who may have occasion to handle this material (used as fertilizer) should realize that castor pomace generates carbon dioxide, and if this gas concentrates in sufficient quantity it is capable of causing instant death.

On June 19, 1940, the S. S. Ellenor was commencing to unload at Tampa, Florida, and one of the longshoremen climbed down into the hold. He was immediately overcome and succumbed almost instantly to the effects of the noxious gas. A second longshoreman reached only the bottom rungs of the ladder when he, too, was observed to fall off and become convulsed. He was later revived by inhalator treatment. It was found that the castor pomace, which was being carried in sacks, had emitted carbon-dioxide gas which characteristically lay close to the top of the cargo.

These tragic examples bring home the absolute necessity for the utmost care, and for the proper understanding of the nature of the gas and its deadly effect.

Always be sure that ventilation is adequate and that fresh air can circulate and so dispel the dangerous gas. Remember that the gas is heavy and will sink to the bottom and lower part of the hold and lie there in a dangerous concentrate. Moisture formation should be avoided as this aids the dissemination of CO_2 from cargoes which manufacture it, and the holds should be thoroughly ventilated, particularly the lower levels, before being worked. Incomplete ventilation may prove worse than no ventilation at all, since it would have the effect of raising the level of the layer of CO_2 gas without dispersing it.

Prevention is better than cure and that is the purpose of this article, but in the event that any should become asphyxiated the following are the symptoms.

Symptoms: The symptoms of poisoning with carbon dioxide vary with the concentration of the gas. Inhalation of the pure gas or one of very high concentration is followed by almost immediate choking and strangulation, loss of muscular power to such an extent that the subject falls as if struck by lightning, loss of consciousness, and death from asphyxia.

If the amount be somewhat smaller, the above symptoms will be less intense, so that the individual may be able to get out of the dangerous place before the loss of muscular power is more or less complete. Premonitory symptoms of danger are quickened breathing, dizziness, ringing in the ears, nausea, and other sensations; but if the victim returns to the fresh air immediately, the symptoms, as a rule, will soon pass off.

Rescue Precautions and First Aid: Do not enter a hold or other suspected area without protection, namely, some form of oxygen breathing apparatus or fresh-air nose mask. If an atmosphere of carbon dioxide is entered without proper protection, a person will collapse after the first few breaths because of suffocation from lack of oxygen.

Remember carbon dioxide always hangs at a low level.

Rescue shoulder high.

Remove to outside asmosphere quickly.

Apply artificial respiration and inhalator treatment.

Recognition has been given to the importance of the proper ventilation of cargoes in the Bureau's examinations for licensed officers. It has been stressed in all cargo papers and made the subject of a special paper for masters.

—Bulletin Bureau of Marine Inspection and Navigation.

Privilege and Responsibility

(*Continued from page 45*)

sea and of employment on the sea went to work to analyze the causes and the best remedies for the protection of this important industry, which is an essential factor in the preservation of our national life. After all was said and done, it became crystal clear that the maritime industry had well within its own grasp the complete solution to the problems confronting it.

The Solution

To insure a safe and loyal American Merchant Marine, the foundation stone must be a complete appreciation of the fact that authority on board ship is entrusted to those who sail with licenses. The next step must be complete support by shipowner and Government of that authority when it is lawfully exercised.

MARINE DEPARTMENT
AETNA INSURANCE CO.
QUEEN INSURANCE CO.
MARITIME INSURANCE CO., LTD.
FIDELITY PHENIX FIRE INS. CO.
Commercial Hull Dept.
AUTOMOBILE INS. CO.

MATHEWS & LIVINGSTON
Marine Underwriters
200 BUSH STREET · · · · SAN FRANCISCO
Offices at: Colman Bldg., Seattle · 111 West 7th St., Los Angeles

In effecting this, a national government that has enacted laws for the protection of labor must also recognize in the administration of such laws that a unique condition exists with respect to those who work at sea; that a man who could create purely a labor problem ashore by the discharge of a subordinate may, at sea, be taking such an act because of his obligation as a representative of government; that such an act ashore may be completely cognizable as a labor problem, but that such an act at sea may very well be a matter of ship government which should in no way be regarded as a labor problem.

There is ample legal authority for this viewpoint. A Circuit Court of Appeals for the Federal Government in July, 1938, issued the dictum that the prime obligation of a shipowner and a master is to insure that a vessel into which lives and property go will be safe and seaworthy, and that an essential element in the safety and seaworthiness of a vessel is the trustworthiness of a crew as a unit. In making that decision with respect to a case in which a master refused to reemploy men who had engaged in a sitdown strike, although admitting that each and every man affected was capable and efficient as an individual, it was held that the master was well within his rights because he did not feel they were trustworthy as a unit.

The decision was appealed to the United States Supreme Court, and the United States Supreme Court refused to disturb this dictum by denying an application to review the ruling of the Circuit Court of Appeals.

Licensed Officers Ready

The Maritime Commission, to insure that its beliefs in this respect were founded on an actual present factual basis, sent two members of its staff to all coasts to make a survey along these lines.

These representatives found, from talking frankly to the men who knew most about this subject—the licensed officers of our merchant marine—that there would be a readiness and willingness on the part of those licensed officers, provided they got proper backing from their employers and their government, and their own organizations, to see to it that the men who sail American ships are loyal to their government, trustworthy in the discharge of their duties, and reliable in emergencies.

Such procedure has been definitely adopted as our approach to the solution of the problem of combating subversive activities on American ships. We are definitely committed to urge that the master of a vessel and the licensed officers to whom he delegates his authority will have the right to select the crews who serve under them; to accept those who they know to be competent, efficient, reliable and trustworthy as loyal Americans and to refuse to select those respecting whom they do not have such an assurance. Representatives of shipowners have indicated that they will respect and give their full and unequivocal support to such a procedure. The Maritime Commission, insofar as any vessels coming under its authority are concerned, has assured the owners of those vessels that so long as they observe this procedure, they in turn will have the complete backing of the Government.

This proposition is confronted with only two objections which seem to carry any weight at all. The first was that such a step might contravene provisions of existing collective bargaining agreements. I have checked into the existing collective bargaining agreements, and I find that there can be no question of any contravention of an existing collective bargaining agreement in this respect.

The second objection was that the master and his licensed officers might use such power for the purpose of "union-busting" and blacklisting those especially active in organization work.

If, under any conceivable scheme, the authority thus given licensed officers to use for the benefit of the American Merchant Marine should be prostituted by them to frustrate the free right of men to join labor organizations of their own choice and to maintain such organizations, the Maritime Commission and the Government of the United States would insist upon the most drastic action being taken against such charlatans.

You are free men. You are entitled to take any action you deem proper. The law of this nation gives you its protection in banding together to advance your interests on a parity with the investors and their representatives who have banded together to set up and operate the companies for which you work.

The fact that you have here in this country the freedom which you are today enjoying brings with it an obligation just as substantial as the benefits you enjoy. That obligation is to see to it that the interests of the nation which provides you with freedom are protected to the ultimate degree. The people of a democracy are the guardians of their own liberty, and they will hold that liberty only so long as they see to it that no inimical interests are allowed to transfer free and democratic processes to dictatorial hands.

(Abstract of an address before the Marine Engineers Beneficial Association, 65th National Convention, St. Louis, January 23.)

Steady as You Go!

(Continued from page 44)

them in a liquid state it coagulates quickly, and will plug them up, possibly requiring new piping owing to the difficulty in removing the mass. As the latex has an anti-coagulant in it, such as ammonia, coagulation does not take place until the ammonia evaporates, but this happens fairly rapidly. Stow away from goods that are damaged by ammonia odor and destroy all dunnage affected by leakers.

Crude rubber usually shipped in bags, barrels or cases requires careful handling, and cool, dry, stowage. Heat causes deterioration; moisture causes mold and massing of contents. Use care in separating lots on account of different value of grades. Guard against dust, etc., getting into the rubber as this has been a prolific source of claims. As cases crush easily, do not stow any but light cargo on top. While not very odorous, unless deteriorating, it is advisable to keep in separate compartment from goods affected by taint.

Fireman's Fund Personnel

Frank L. Emerick, special agent for Fireman's Fund and Home Fire & Marine insurance companies in Western Washington, retired on February 28, after thirty years active service, in accordance with the companies' retirement plan.

Mr. Emerick started his insurance career in Nebraska, and then came to the Pacific Northwest, where he was employed with the Washington Fire Insurance Company. He became associated with Fireman's Fund in 1911 when it reinsured the Washington company. During 1920 he served as president of the Fire Underwriters Association of the Pacific.

Mr. Emerick is one of the most widely known special agents in the northern territory. He is an expert horseman, former polo player, and has a unique ability for public speaking on insurance and other subjects.

* * *

Richard W. Hunner retired recently from active service in Eastern Washington and Northern Idaho where he represented Fireman's Fund and Home Fire & Marine insurance companies as special agent for the past 17 years.

Mr. Hunner's activities are to be taken over by **L. J. Colby,** who has been associated with him in the companies' Spokane service office since March, 1937, and **Glenn F. Lett,** who has recently assisted Mr. Hunner in field work.

* * *

Enterprise Appointments

Captain C. S. McDowell, president and general manager of Enterprise Engine and Foundry Company, announces the appointment of Hans Bohuslav as vice president in charge of engineering, C. G. Cox as vice president in charge of sales, and C. M. Sayre as vice president in charge of production.

In releasing this news, Captain McDowell stated, "The high rate at which we are now operating dictates the necessity for the utmost efficiency in all departments of our business. The advancement of these three men to these positions will, we feel, help immeasurably in meeting the many new problems resulting from the requirements of the National Defense Program and the highly accelerated tempo of general business."

Chas. G. Cox

Buhoslav has been with the Company for eight years. Cox came to Enterprise in 1934. Sayre joined Enterprise in November, 1940.

Janet Davis of A-H Heads Women's Traffic Club

Miss Janet Davis of American-Hawaiian Steamship Co. is new President, Women's Traffic Club of San Francisco, who will be installed on March 18th, at the Palace Hotel, French Room

Another year has rolled around and the **Women's Traffic Club of San Francisco** held another meeting at which time the following officers were elected to serve the ensuing year:

Miss Janet Davis, American-Hawaiian S. S. Co., President.

Mrs. Mary-Lu Bunnell, Western Union, Vice-President.

Miss Ethel Singer, Dunham, Carrigan & Hayden, Secretary.

Mrs. Berneice Stuart, Panama Pacific Line, Treasurer.

The following have been elected to serve on the Board of Directors:

Miss Nan G. Lawrence, S. F. Machinery Dealers Assn.

Mrs. Gertrude Verbarg, Western Pacific Railroad.

Miss Ruth Casella, Howard Automobile Co.

Our installation party will be held on March 18th, at the Palace Hotel, French Room, at which time the above officers will be installed.

Miss S. S. Marks of the Shipowners' Association of the Pacific Coast is our "reporter."

"The Mariners" Roll Down to Rio

Captain A. T. ("Tom") Hunter, the 1941 President of The Mariner's Club of California, is piloting the good ship on what promises to be a most successful year, if the first two meetings staged during January and February are the criterions we believe them to be.

A grand turn-out of the shipmates responded on Tuesday noon, February 11th, in the beautiful new Mural Room of the St. Julien on Battery Street. The feature of the day was the projection of the Moore-McCormack Line's film, "Incredible Rio."

Skipper Tom presented another oldtimer to the audience following the precedent he established at the first meeting over which he presided. Guest introductions by members followed.

Thoroughly enjoyed to the point of real enthusiasm was the Rio travelogue. Color technique and sound were superb. About one-half of the film depicts the pleasurable life aboard a Mormac luxury liner. Arriving in "the world's most beautiful harbor" the spectator journeys through this wonder city of South America where old traditions of Brazilian life mingle with modern influences. Moore-McCormack Lines have assuredly turned out a magnificent job in this film.

"Sailormen" in attendance at this Mariners' event included representative figures of the San Francisco ship operating, shipbuilding and marine supply industries, and for good measure, several guests from Seattle, Portland and Los Angeles.

Stanley Allen, secretary, tells us as we go to press that plans for the March get-together will soon be ready for announcement.

EUGENE V. WINTER

A beloved friend of all of us has answered the last call and it is with deep sorrow that we chronicle the passing of Eugene V. Winter.

"Gene," as we affectionately called him, is best known to Pacific ship men by reason of his long established marine supply firm in San Francisco. But his many friendships did not begin nor end with his business contacts: he won the esteem and regard of countless men with his rare ability to win and maintain strong fellowship with the boys on the 'front.

Gene Winter will be especially mourned by the members of The Mariners Club. Since its inception he has been a loyal, hardworking member. It was Gene's office which functioned as clearing house for the club's mailing and reservation details.

Captain Tom Hunter spoke the words which were in all our hearts when he adjourned the February program meeting in respect to our lost shipmate.

From out of the East has come this tribute:

Eugene V. Winter, dean of industrial agents for Koppers Company, American Hammered Piston Ring Division, and well known throughout the San Francisco marine trade, died February 7, in San Francisco.

Mr. Winter was a native of San Francisco. He was the first industrial agent to be employed by American Hammered and has represented the firm for about 15 years. He also represented the Diesel Engine Division of the American Locomotive Company.

" 'Gene' Winter held the confidence and respect of the entire American Hammered organization, not only for his great business ability but for his loyalty and his friendly and sincere personality," said John A. Worthington, manager, industrial sales and engineering for American Hammered.

* * *

S S Night for PTA

Plans have been completed for the Fifteenth Annual Steamship Night celebration of the Pacific Traffic Association to be held in the Terrace Room of the Fairmont Hotel, San Francisco, on Tuesday evening, March 11th.

Frank Herberth, Jr., American Hawaiian Steamship Company, is chairman of the steamship committee in charge of arrangements for the evening, assisted by John F. Hanavan, Furness Line; William J. Gleason, McCormick Steamship Company; Guy R. Shelton, Luckenbach Line, and John R. Wagner, American President Lines.

From the United States Maritime Commission

January 30, 1941.

Pacific Marine Review,
San Francisco, California.

Dear Sirs:

Will you please express to your fellow publishers and editors the deep appreciation of the Maritime Commission in general and myself in particular for the tribute you have paid to the Commission in dedicating this number of the "Pacific Marine Review" to the Maritime Commission.

All hands are very grateful for the courtesies extended and I feel sure that the publicity given by you in your excellent magazine will prove of benefit to the American Merchant Marine.

Sincerely yours,
E. S. Land,
Chairman.

February 3, 1941.

Pacific Marine Review,
San Francisco, California.

Dear Sirs:

Thank you very much for your letter of January 29, stating that you are forwarding 50 complimentary copies of your January Blue Ribbon Edition for distribution to members of our technical staff.

The extra copies have just been received and, as suggested by you, I am having these distributed. I am sure our personnel will read with pleasure and appreciation the nice tribute paid by the Pacific Marine Review to the work and efforts of the Commission.

Again thanking you and with all good wishes, I am

Sincerely yours,
H. L. Vickery,
Commissioner.

February 3, 1941.

Pacific Marine Review,
San Francisco, California.

Gentlemen:

The receipt is acknowledged of your letter of January 24, 1941, attaching tear sheet of my paper "Engineering Features of the Maritime Commission's Program" which is published in your current edition.

Since the receipt of your letter, I have seen a copy of your January issue, containing Admiral Land's excellent article on "Maritime Commission Policies," and also my paper previously referred to. I think it is well that the marine and the ship-building industries are kept abreast of what the Government is doing in these fields, and your magazine is doing much to aid in this respect.

Very truly yours,
J. E. Schmeltzer, *Director,*
Emergency Ship Construction Division.

KENNETH FRASER

Friends in San Francisco of Kenneth Fraser, managing director of the Yorkshire Copper Works, Ltd., of Leeds, England, will regret to learn of his death February 17th at Leeds.

He was a world renowned authority on condenser tubes for marine application, and in past years a familiar figure to the San Francisco waterfront in the interests of his firm.

He was instrumental in producing an aluminum-brass alloy, known as "Yorcalbro," which was the means of practically eliminating condenser tube troubles in steamship operation.

Details of his untimely death are lacking, but it is assumed that he may have lost his life during a bombing attack, and so passes another colorful figure loved by all who were fortunate enough to know him.

The S.S. America Visits Us

Eastbound with 750 passengers, the palatial United States Lines America left San Francisco on February 18th after five hectic days in the Bay City port.

Thousands of people crowded pier 35 to see the great ship and thousands more passed through the ship on the one visiting day allowed by strict maritime regulations. Exactly 11,407 persons visited the America in six hours Sunday.

Civic receptions, luncheons and dinners welcomed the "unchallenged queen of the American Mechant Marine" from the time she arrived on Friday until she left.

The America, on its first run on the intercoastal service, carried 800 people out from New York who jammed hotels, restaurants and shops in the Bay area.

Joining the Washington and Manhattan in the intercoastal run, the America rounds out the trio of the finest three liners in the United States now in the Pacific run.

The intercoastal trip takes 14 days from San Francisco and 12 days from Los Angeles to New York. Stops are made en route to Acapulco, Mexico; Balboa and Cristobal, Canal Zone, and Havana, Cuba.

The American Merchant Marine in National Defense

by Arthur M. Tode,
Honorary President, The Propeller Club of the United States

It is one of the prime difficulties of democracy in America that its citizens have rarely been able to think in terms of both oceans. The tardiness of the great central states to face the reality of overseas risks naturally looks both ways. But the East has difficulty in recalling the problems of the Pacific, and the West understresses the dangers in the Atlantic.

The hard-headed realists of the Axis powers have no such difficulty. The military rumors that a German all-out attack upon England, if it comes this spring, will be carefully timed to coincide with a Japanese thrust to the south simply record an obvious probability. These ruthless strategists were thinking of America in terms of its two lengthy coast lines when they extended the Axis to include Japan, and with luck they might make good the double threat.

Unless the British effort is successful in the coming months the vulnerability of this country to a two-ocean attack will be extreme. With our great coastal cities, east and west, open to bombing, the fate of the nation could hardly fail to be a grievous one. Assuming that American genius would prevail against invasion, who can find it pleasant to contemplate a nation withdrawn within its borders and trading only by permission of the new masters of the waves?

The immediate danger that threatens our Western Hemisphere is not a military invasion—that could come later—but the crafty undermining of our democratic institutions from within. German propaganda in this country has long been identified with fifth column activities and with support of Nazi proposals for a new world economic order, with Germany as the dominant industrial power, and the United States asked to choose between cooperation in these plans, or exclusion from European and other Axis markets. Not for many past decades has the American public been so deeply stirred as now by threats to our national security arising from war.

In this mad scramble for mastery of Europe, which is only the first phase of a determined totalitarian attempt at world domination, 14 nations have completely lost their independence or some part of their territory, over which now flies the flag of a foreign aggressor. In addition alien armies are now maneuvering and fighting in three other quasi-neutral countries. Efforts at conciliation, negotiation and appeasement have proved utterly ineffective.

Arthur M. Tode's timely discussion of an intensely important subject as presented before Pacific Northwest Ports of the Propeller Club is abstracted in this article. Mr. Tode is currently a visitor on the Coast.

But as one European nation still remains uncrushed, the war is not yet decided. In fact, as there is no evidence of a dent in British resistance, the end of this life and death struggle is by no means in sight even though further reserves of massed brutal frightfulness are in store. Control of the sea is still in British hands, and I firmly believe will remain so.

That our Navy has been lagging in its defense program during the past seven years, as has been so frequently, publicly and erroneously charged in recent months, or that we have neglected to see the trend of international developments is fully disproven by the facts. As of December 31, 1940, 145 naval vessels had been built and commissioned since 1933. This is 9 times as many as were built in the 11 years preceding 1933. From a poor third among naval powers in 1933 we have today, the greatest, most powerful and effective Navy of any single nation.

By Presidential orders for the reorganization of the Navy which became effective on February 1st, the United States will have three separate fleets: the Atlantic, the Pacific, and the Asiatic. According to press reports Secretary of the Navy Knox made the laconic statement that this rearrangement was made in order to "fit the facts."

(Page 66, please)

Regional Meeting of the Pacific Northwest Propeller Clubs, comprising the Ports of Seattle, Tacoma, Bellingham and the University of Washington, held at the Arctic Club, Seattle, February 5th, 1941. Head table, reading left to right: Frank Burnett (Pacific American Fisheries), vice president, Propeller Club, Port of Bellingham, Washington; J. L. Moore (J. L. Moore Shipping Company), past president, Propeller Club, Port of Tacoma, Washington; Arthur M. Tode, honorary president, The Propeller Club of the United States; Mrs. Arthur M. Tode, president, The Women's Organization for the American Merchant Marine, Inc.; Harrison J. Hart (Puget Sound Tug & Barge Company), president, Propeller Club of Seattle, Washington; Mrs. Harrison J. Hart; Edward Herges (Federal Compensation Commission), member, Propeller Club, Port of Washington, D. C.; G. J. Ackerman (Seattle-Tacoma Shipbuilding Corporation), president, Propeller Club, Port of Tacoma, Washington

Propellers at Port of Los Angeles Plan for "West Coast" Convention

For Pacific Marine Review
From Norman Dunnavant,
Publicity Chairman,
Propeller Club No. 66

●

The grim threat of war on both the Atlantic and Pacific with an especial emphasis on a naval war in the Pacific was the subject of an address before members of the Propeller Club, Port of Los Angeles No. 66, at the February luncheon-meeting, by Arthur M. Tode, honorary national president.

Mr. Tode saw in the present situation an urgent and pressing need for the immediate improvement of harbors, bases, and the extension of cooperation between the Navy and the American Merchant Marine. He said that the Propeller Club slogan of "For Freight or Trips—Use American Ships," should now be changed to "American Ships for National Defense."

"As of December 31st, 1940, 145 naval vessels had been built and commissioned since 1933," Mr. Tode declared, adding that "from a poor third among naval powers in 1933, we have today, the greatest, most powerful and most effective Navy of any single nation. Our Merchant Marine is likewise growing and is keeping pace with naval development. The two go hand in hand for national defense."

In a prelude to his address, Mr. Tode told of his conferences with Propeller Club leaders in San Francisco regarding the forthcoming convention and asked that members of the Los Angeles Port give full cooperation. "In fact," he said "this convention will be a 'West Coast' convention."

Mr. Tode was expected to sail with Mrs. Tode on the S. S. America but due to the illness of his wife, stricken with a fever and removed to a Los Angeles hospital, he remained over in the southland for several weeks.

James Adams, chairman of the House Committee of the Los Angeles Propeller Club, told of the plans for a joint meeting with the Propeller Club, Port of San Francisco No. 65, to be held the week-end of April 18 at Del Monte. Byron Pickard, chairman of the House Committee for the San Francisco Port, was a guest at the meeting and is working out the arrangements with Mr. Adams for this special meeting.

Ralph J. Chandler, resident manager for the Matson Navigation Company and president of the Propeller Club, presided over the meeting which was held in the Marine Room of the Jonathan Club, Wednesday, February 19.

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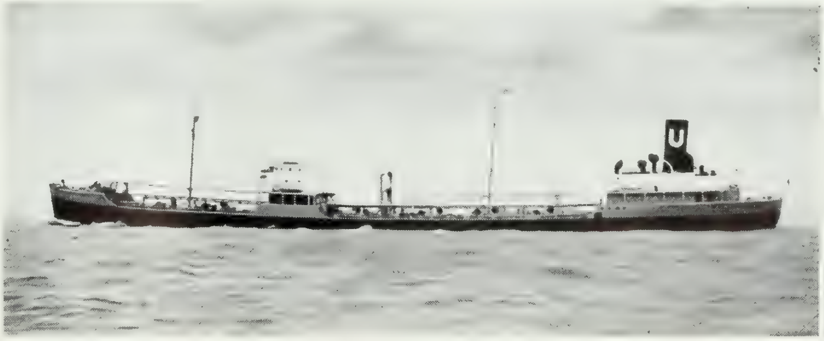
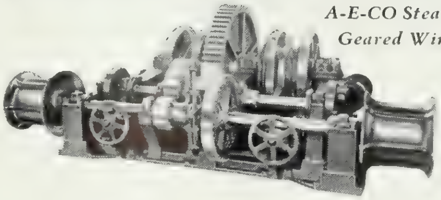
Victor H. Kelly

Choice of the right deck auxiliaries can mean much to the profitable operation of your ships. So place your dependence on the only deck auxiliaries which have a 75-year record for reliability, economy and low maintenance.

The Union Oil tanker Victor H. Kelly, like its sister ship, the St. Clair, is fully equipped with A-E-CO Deck Auxiliaries. This outstanding ship, already in West Coast service, is fitted with an A-E-CO Quadrant Type Steering Gear, and A-E-CO Steam Triple Spur Geared Windlass, 2 Compound Geared Winches, 2 Single Geared Cargo Winches and 4 Steam Gypsies.

Insist on A-E-CO, the preference of America's distinctive architects, builders and owners.





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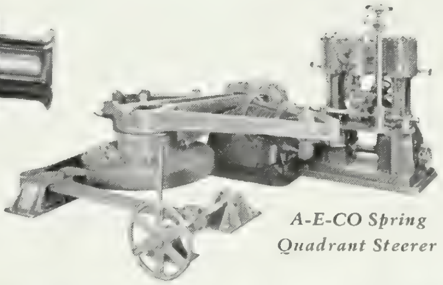

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Joint meeting of the Propeller Club, Port of Portland, Oregon, and the Propeller Club, Port of University of Oregon, held at the Multnomah Hotel, Portland, Oregon, February 7th, 1941. Standing at head table, reading left to right: Prof. Alfred A. Lomax, president, Propeller Club, Port of University of Oregon; Arthur M. Tode, honorary president, The Propeller Club of the United States; A. R. Frey (McCormick Steamship Company), president, Propeller Club, Port of Portland, Oregon; William H. Collins (American Hawaiian Steamship Company), past president, Propeller Club, Port of Portland, Oregon; K. C. Konyers (McCormick Steamship Company), past president, Propeller Club, Port of Portland, Oregon

Existing tragic world conditions have emphasized the indispensable advantage of naval strength and brought us to the stern realization that, for real security, we must be prepared to defend ourselves in any ocean against a combination of fleets of several other nations. A recent triple "cooperative" military pact signed by certain European and Asiatic totalitarian powers definitely assures us that for the next ten years, at least, the United States will never be faced by a *single* belligerent nation in only *one* ocean. We are not prepared to meet alone a challenge from such an alliance.

Immediately after the World War we had the largest Navy in the world (built and building)—40% greater than that of Great Britain, our nearest competitor. However, by the Washington and London treaties of 1922 and 1930, respectively, we lost 929,000 tons of fighting ships,—nearly half of our 2,100,000 tons of 1922. Between 1922 and 1933 only 16 units were built to replace obsolete vessels. Due to the intervening 11 years' holiday in naval construction our shipbuilding industry had become atrophied, and a large part of its machinery and equipment had become obsolete.

In 1933 sufficient funds from N. I. R. A. were set aside to start construction on 37 warships. The next year the Vinson-Trammell Act authorized building the Navy to treaty strength. In 1938 an increase of 20% was authorized. This was followed early last year by another increase of 11% in tonnage, thus bringing the total allowed underage strength of the Navy to 1,724,480 tons.

An additional bill, enacted in September, gave the Navy a 70% increase in strength, or 200 combatant vessels aggregating 1,325,000 tons plus 2400 planes at a total cost of $3,969,053,312. This most gigantic shipbuilding program in all naval history will bring our total to 651 combatant vessels of 3,412,440 tons and 15,000 aircraft, the largest and most powerful Navy in the world, capable of meeting any demand that may be made upon it, including a simultaneous attack in either or both oceans by a combination of belligerents.

Naval strength is not measured in fighting ships and personnel alone. Seapower consists of three elements—the Navy, the merchant marine and bases. Without bases, in adequate number, for the service of the fleet, the entire strategical situation of a maritime nation is altered.

Without strategically located bases, it becomes necessary for naval ships to carry extra ammunition, food and other consumable supplies; either military characteristics (such as armor protection or guns) must be sacrificed or fuel capacity (upon which depends speed) must be reduced. It is therefore evident that the lack of bases directly affects even the designs and characteristics of warships and auxiliaries, which, in turn, directly influence tactical and battle plans.

Prudence dictates, not only the enlargement of present operating bases, but acquisition of additional adequate supporting shore facilities on both coasts for maintenance, repair and provisioning, in order to care for the entire strength of the new fleet operating as a unified force in either ocean.

This means harbors, moorings, drydocks, shops, supply depots, hospitals and all the multitudinous shore developments needed by a modern Navy. The Navy Department has been making a comprehensive study of such additional shore facilities and expansion is being pressed rapidly at a cost, it is reported, of not less than $750,000,000.

The possession of the new bases which the United States has been and is acquiring is of triple value: first, by lessening the chances of attack against our shores; secondly, by providing outposts, with magnificent advantages of position, from which to challenge such attack, if and when it comes; and thirdly, by permitting us to take more deliberate action with regard to the use of our main fleet, now in Hawaiian waters.

The acquisition of bases within the American defense zone is one of the greatest defense strokes ever made in behalf of the protection of this country, increasing, as it does, our east coast security enormously. Similarly it greatly strengthens our capacity for more adequate defense of the Western Hemisphere. Without them our security plans would have remained dangerously vulnerable.

As true today as when first uttered by the great Admiral Nelson: "A line of battleships is the best negotiator in the world." Experience, as recorded in history, shows that a strong Navy is not only the best protection against the hazards of war, but also the greatest bulwark of peace. No nation having full command of the sea has ever yet lost a war.

Napoleon once said that "War is a business of position." With this in mind, and because of our geographical situation, victory in any war in which we may be engaged depends on our having a command of the sea. Such command can never be obtained by mere defensive

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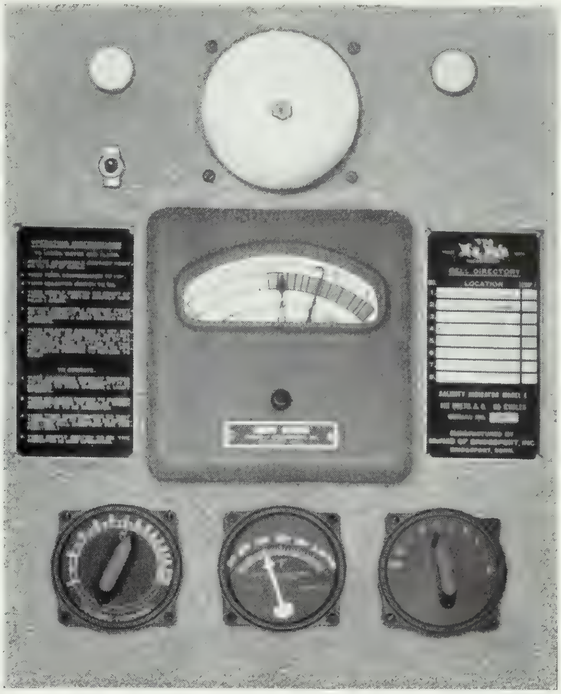

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methods. In sea-warfare the Navy's role is emphatically and continuously the offensive. One of Admiral Mahan's maxims, which stands out with particular significance in this connection is: "The assumption of the defensive in war is ruin. War, once declared, must be waged aggressively, relentlessly. The enemy must not simply be fended off, but smitten down."

To this end, the United States present peace-time naval expansion program, when completed will have so vastly increased our Naval strength that when and if war should come we will be well prepared to take and retain command of the sea, in its fullest meaning, against the fleet of any nation or combination of nations in either the Atlantic or the Pacific, or in both oceans simultaneously. Thus, the two-ocean threat will have been met when those two oceans are impregnable again; when their approaches are defended by a two-ocean Navy adequately supported by outpost bases from which to operate our aircraft and ships of war.

◆

Mormacstar Skipper

Captain Eric H. Petrelius, who joined Moore-McCormack Lines in 1923 as seaman and worked his way up through the ranks to the command of his own ship, is taking the helm of the company's new cargo liner, the Mormacstar, which was delivered on January 30, by her builders, the Moore Dry Dock Company at Oakland, Calif.

The Mormacstar, first of three new sister ships, will operate in the company's Pacific Republics Line service between the Pacific Coast of the United States and the east coast of South America. The vessels will greatly speed up cargo shipments between the Americas, for they will turn around in about 90 days whereas the vessels now operated required between 130 and 145 days.

Propeller Club News

The Port of San Francisco

Charles L. Wheeler
President
John E. Cushing
First Vice-President
Arthur B. Poole
Second Vice-President
Hugh Gallagher
Third Vice-President
Eugene F. Hoffman
Secretary-Treasurer

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Marshall Levis
Ira S. Lillick
Capt. Lewis Mesherry
Joseph A. Moore
Arthur B. Poole
Charles L. Wheeler

◆

Secretary Gene Hoffman of the Port of San Francisco Propellers induced a record attendance to come aboard to hear **Arthur B. Poole** on February 13th—by pre-endorsing the speaker's subject material.

Arthur Poole, vice president and treasurer of American President Lines, more than made good for our estimable secretary. His topic, "The Inter-American Shipping Conference," proved of absorbing interest to every man present. This recent conference was attended by United States Maritime Commissioner Max Truitt and Dr. Henry F. Grady, new president of American President Lines.

Guest of honor at the event was Honorary President of the Propeller Clubs of the United States **Arthur M. Tode,** now on a tour of Coast Ports and here in San Francisco to give the official "go ahead" to tentative plans for the big national convention to be held here in October.

By the way, the dates are now set. The 15th Annual Convention and Merchant Marine Conference will occur from October 21st to 23rd, inclusive. The Fairmont will be Convention Headquarters Hotel.

San Francisco will open its Golden Gate in hospitality to the Merchant Marine World!

◆

Adopts Ship

At highly colorful ceremonies on February 19th at the harbor in Long Beach, 35 schools in the Los Angeles and Long Beach area adopted the Moore-McCormack Lines' new Mormacstar. Over 1500 students visited the ship, and later gathered at the Long Beach Auditorium where Moore - McCormack's technicolor and sound travelogue, entitled "Incredible Rio," was shown.

Recently at Portland, Oregon, some 18 public schools in the Rose City also adopted this same vessel.

Tremendous interest in Latin American relations has been developed through the Ship Adoption program sponsored by the Propeller Clubs of America and the United States Maritime Commission.

Captain E. H. Petrelius, who welcomes all the school children on board, was the recipient of many valuable gifts, and will undertake to keep all of the school children informed of the future operation of his vessel.

All activities of this nature are calculated to further cement our "Good Neighbor" relations and develop an interest in the countries to the south of us where trade and travel will be developed for the future.

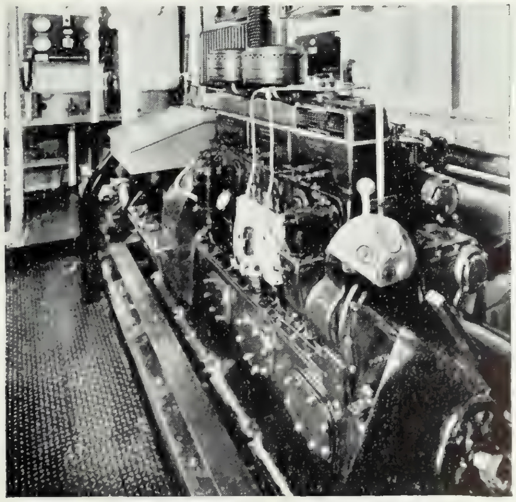
Commander K. H. Donavin, assistant to the president; W. T. Moore, assistant vice president, and Ralph W. Bybee, Western traffic manager, have all been in attendance at these ceremonies, representing Moore-McCormack Lines.

DAUNTLESS No. 14

DAUNTLESS No. 14—110' ALL-STEEL TUG
Built by Jakobson Shipyard, Oyster Bay, N. Y. Owned by Dauntless Towing Company, New York, N. Y. Equipped with SUPERIOR Diesel auxiliary power unit.

AGAIN the "Power House" of one of New York's newest and finest seagoing tugs includes a SUPERIOR Diesel auxiliary unit! Launched early in November, this most recent addition to the well-known Dauntless Towing Company fleet is already a highly respected member of New York's vast "Power Squadron."

The selection of SUPERIOR auxiliary power for DAUNTLESS No. 14 is eloquent testimony to its increasing popularity in the tow boat field.



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A STRIP of Alundum Tile replaced the original tile down the entire length of this row of ranges. Now the busy chefs have a safe, sure footing even when liquids are spilled—and the non-slip surface of the Alundum Tile will never wear slippery.

Catalog A gives full information about Alundum Tile. Write for a copy—also for Catalog B which describes Alundum Ceramic Mosaic Tile, another Norton Floors product.

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PACIFIC MARINE *Reviews*

New Mackay Station

The opening of a marine radio service station at Portland, Oregon, on a full time basis is announced by S. W. Fenton, Marine Superintendent of Mackay Radio and Telegraph Company.

This station will carry a full stock of spare parts and expendable items for all types of marine radio equipment and will be available to all steamship companies and agencies in the Portland-Columbia River area.

This new full time service station joins the rapidly expanding chain of service stations of Mackay Radio on the Atlantic, Gulf and Pacific Coasts.

Admiral Cone is Mourned

Admiral Hutchinson I. Cone, Rear Admiral, U.S.N., Retired, and Chairman of the Board of Moore-McCormack Lines, died recently after an illness of several months.

Admiral Cone had a long and distinguished career both in the Navy and in connection with the Merchant Marine. He was an eminent engineer officer in the naval service and was Chief of the Bureau of Engineering. During the World War he served with distinction with the U. S. naval forces in Europe. Subsequent to the war, he became Chairman of the U. S. Shipping Board, after which Chairman of the Board of Moore-McCormack Lines, which position he held at the time of his death.

His funeral took place February 14, and he was buried in Arlington National Cemetery, Arlington, Va.

Personals

Norman E. Dunnavant, publisher of the Los Angeles Commercial News and Daily Shipping Guide, has been proposed for appointment to one of the two vacancies on the Board of Governors of the California Maritime Academy. His many friends are writing Governor Culbert L. Olson urging the appointment.

Harry A. Burdorf and Frank P. Rhame, Vice Presidents of the Lunkenheimer Company, Cincinnati, Ohio, were elected to the Board of Directors at the annual stockholders meeting of February 27th.

Mr. Burdorf, who has been with the company since 1905, is Vice President in charge of sales, and Mr. Rhame, who has been with Lunkenheimer since 1919, is Vice President in charge of sales engineering. Both are well known in business and industrial circles.

Dan A. Lyons, formerly contracting manager, Consolidated Steel Corporation, Ltd., Los Angeles, Calif., has been appointed as Vice-President of the Colby Steel and Engineering Co. of Seattle.

The new year saw some interesting transfers and promotions among Pabco's paint salesmen—but this year two of them "transferred" into the Navy!

Captain Jim Baldwin, marine salesman, went from Pabco to Pearl Harbor. At the latter place he will be a lieutenant commander in the Navy.

George Ferenz of the San Francisco office got his transfer to Pensacola, Florida, as a gunnery expert in the U. S. Naval Air Corps. He will be replaced at Pabco by Sam K. Cook, Los Angeles salesman who formerly handled the position left by Ferenz.

Binder Twine Industry Speaks

Through the courtesy of Columbian Rope Company we have received the valuable and informative booklet recently issued by the United States Binder Twine Committee.

Bearing the startling title, "America's Food Supply Depends Upon American Binder Twine," the booklet follows a "pictographic" style of presenting basic facts. Here are important highlights:

1. The principal food supply of the United States, small grains, is dependent upon an adequate and assured supply of binder twine.

2. This supply is endangered by the unrestricted flooding of the United States markets with foreign-made binder twine, which is possible because of low wage rates in foreign countries.

3. Private manufacturers and prison plants producing binder twine are unable successfully to compete with foreign-made binder twine in either foreign or domestic markets.

4. The production of binder twine by private manufacturers has decreased from 239,000,000 pounds in 1923 to 88,000,000 pounds in 1939, and production by state prisons decreased from 57,000,000 pounds in 1927 to 36,000,000 pounds in 1939, because:

   (a) Exports of binder twine decreased from 74,500,000 pounds in 1923 to 4,000,000 pounds in 1939;

   (b) Imports of binder twine increased from 13,400,000 pounds in 1923 to an average of 60,000,000 pounds per year for the five year period 1935 to 1939;

   (c) Consumption of binder twine in the United States decreased from an estimated 234,000,000 pounds in 1923 to less than 200,000,000 pounds in 1939;

5. Every country where binder twine is manufactured (except the United States and Canada) has levied tariffs upon its importation;

6. Preventing the further crippling of the domestic binder twine industry is the best defense the farmer can have against higher costs of binder twine, possible extortion by foreign interests, and shortage of binder twine occasioned by war or any other circumstance.

The booklet is issued by the United States Binder Twine Committee, 308 Normandy Bldg., Washington, D. C.

Sperry Vice President

The election by the board of directors of Louis F. Malkovsky to the position of vice president of the Sperry Gyroscope Company was announced Feb. 19 by Thomas A. Morgan, president of the Sperry Corporation and chairman of the board of the Sperry Gyroscope Company. For the past five years Mr. Malkovsky has been factory manager of the company.

A veteran of twenty-six years with Sperry, Mr. Malkovsky has worked in every department of the Sperry factory. In his new position he will be in direct charge of production on the entire line of products of the Sperry Gyroscope Company. These include the Gyro-Compass, Automatic Pilots for ships and airplanes, Blind Flying Instruments, Searchlights and Sound Locators and many other devices now being manufactured in large quantities for the government services and for the aeronautical and marine industries.

During his career with Sperry, Mr. Malkovsky has personally engineered and built many of the special tools used to manufacture Sperry products.

In making the announcement, Mr. Morgan said:

"Mr. Malkovsky's promotion to the vice presidency is a fitting recognition of his years of outstanding service and his many contributions. In his new position he will coordinate and direct all of the production activities on the many Sperry products. I feel that he can do much to guarantee that Sperry will continue to meet successfully every demand placed on it for the delivery of our equipment to the Army and Navy and to the marine and aeronautical industries."

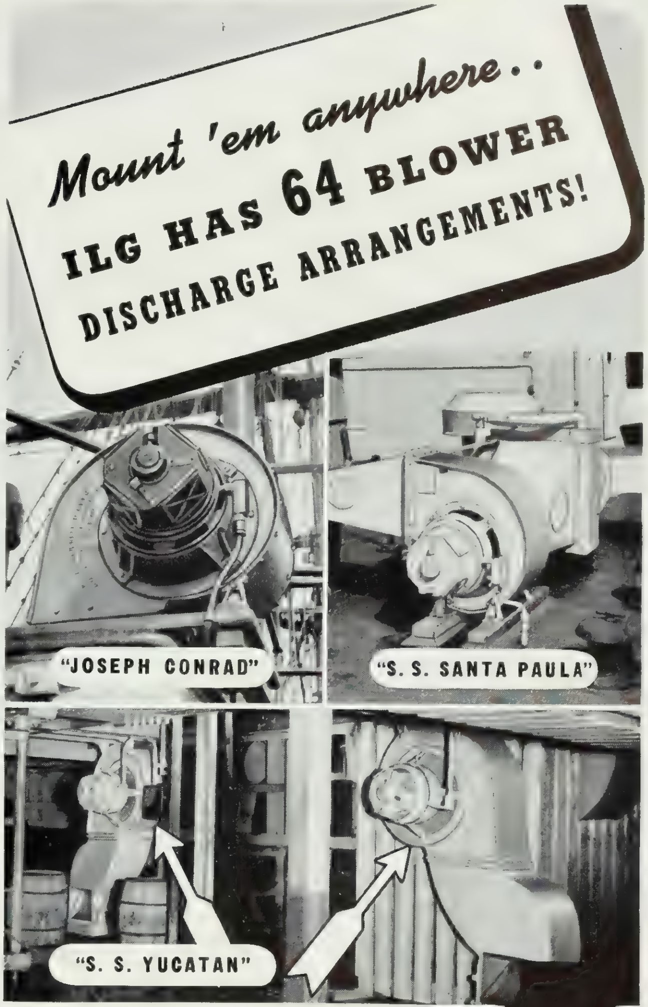
Enterprise Men Honored

Enterprise Engine & Foundry Company was well represented at a recent testimonial dinner given in San Francisco under the auspices of the National Association of Manufacturers and honoring executives and employees who have served thirty-five years or more with their present employers. A contingent of eight Enterprise "old timers" fulfilled the qualification with terms of service ranging from thirty-five to fifty-four years.

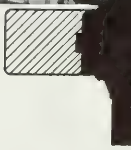
Henry Martens, vice president, and J. W. Heaney, secretary, have both served Enterprise since 1886. In fact, both gentlemen helped to establish the original foundry, which has since developed into a diversified institution which, in addition to its original function, now supplies an international market with marine and stationary diesel engines, commercial and industrial oil burners, and processing machinery for the food, chemical and other industries.

Fifty years of service brought recognition to **Charles P. Hoehn, Sr.,** who began as an apprentice molder and is now chairman of the board. Other Enterprise employees with from thirty-five to forty years' service were Harry Hoehn, Sr., Gustave Penning, Louis Brisolesi, Daniel Garle, Enrico Fregulia.

The appointment of **B. Stockfleth** as assistant to the president was announced on February 24 by **Captain C. S. McDowell,** president and general manager of Enterprise Engine & Foundry Company. Mr. Stockfleth was formerly with the Soulé Steel Co. of San Francisco. Previous to that, he was with the George S. May Co., Industrial Engineers, of Chicago, and the International Harvester Company.



Perhaps you cannot mount ILG Blowers just *anywhere,* but you'll be amazed at their flexibility. With 64 discharge arrangements available for wall, deck, or ceiling mounting . . . angle discharges . . . right and left motor mountings . . . and since motor is direct connected to blower wheel, making for an extremely compact unit . . . you'll have mighty few location and installation problems. To get this whole story . . . and description of the many ILG features for marine applications . . . send for Catalog EB-381 now!



DIRECT CONNECTION SOLVES LOCATION PROBLEMS, TOO!

▨ "Cross-hatch" area shows EXTRA space required by coupled motor mounted on separate pedestal.

■ Solid black area shows space required by an Ilg Direct-Connected Universal Blower.

ILG ELECTRIC VENTILATING CO.
2837 N. CRAWFORD AVE., CHICAGO, ILL.
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VENTILATION
AND AIR CONDITIONING
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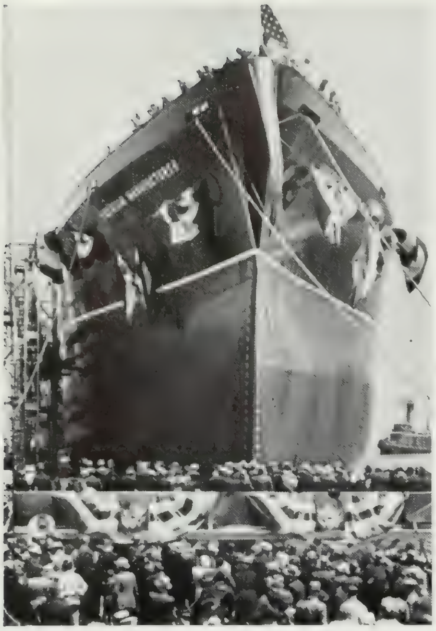

Pacific Coast

ASSOCIATED SHIPBUILDERS
Seattle, Wash.

New Construction:

One 500-ton covered lighter for delivery to U.S. Navy at Puget Sound Navy Yard. **Delivery date February 3, 1941.**

One insulated self-propelled lighter for delivery to U. S. Navy at Puget Sound Navy Yard.

Four small seaplane tenders for delivery to Puget Sound Navy Yard.

Conversion:

City of Newport News to transport U. S. S. Fuller.

ASTORIA MARINE CONSTRUCTION CO.
Astoria, Ore.

New Construction:

Hull No. 1100, wood hull troller. 41′ x 11′ x 4′6″; Chrysler Crown engine. Delivery date April 1, 1941.

Hull No. 1090, wood hull trawler for stock. 56′ x 15′6″ x 7′6″; 135-hp Superior diesel engine.

Hull No. 1111, wood hull trawler. 60′ x 12′ x 6′; 100-hp Caterpillar diesel engine. Delivery date April 1, 1941.

BASALT ROCK CO., INC.
Napa, Calif.

New Construction:

Eight steel open lighters; owner, Bureau of Supplies and Accounts, Navy Dept., Washington, D. C. Delivery at Mare Island. 110′ x 34′ x 11′3″. Contract awarded September 5, 1940. **Delivery dates, one per week; first delivered January 20, 1941.**

Eight steel seagoing 1000-ton cargo barges; contractors, Pacific Navy Air Bases. Delivery at San Francisco Bay. 150′ x 40′ x 12′. Contract awarded November 15, 1940.

Two 10,000-bbl. fuel oil tankers for delivery to Mare Island Navy Yard. 235′ x 37′ x 19′; cost $1,800,000. Contract awarded by Navy Dept., Bureau of S. & A., Washington, D. C.

BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Division
(Union Plant)
San Francisco, Calif.

New Construction:

Hulls Nos. 5360-5364, five C-1 cargo vessels for U. S. Maritime Commission. 395′ x 60′ x 37′6″; 6400 gross tons each; 4000 hp. Full scantling steam propulsion type. Keel laid, No. 5364, January 15, 1941. **Launching dates,** No. 5361, October 4, 1940; No. 5362, January 10, 1941; **No. 5363, March 12, 1941; No. 5360 delivered February 5, 1941.**

Twenty-five 2100-ton destroyers for U. S. Navy.

Hulls Nos. 5366-5367, two 1650-ton destroyers for U. S. Navy. Keels laid January 13, 1941.

Four 6000-ton cruisers for U. S. Navy.

BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Division
San Pedro, Calif.

New Construction:

Ten 2100-ton destroyers for U. S. Navy.

COMMERCIAL IRON WORKS
Portland, Ore.

New Construction:

Four anti-submarine net tenders.

CONSOLIDATED STEEL CORP., LTD.
Los Angeles, Calif.

New Construction:

Hulls Nos. 156-159, four C-1-BT, full scantling, turbine propulsion cargo vessels for U. S. Maritime Commission. Keel laying date, No. 159, April 1, 1941. **Launching dates, No. 157, March 27, 1941;** No. 158, May 29, 1941; No. 159, July 24, 1941. Delivery dates, No. 156, April 25, 1941; No. 157, June 25, 1941; No. 158, August 5, 1941; No. 159, October 3, 1941.

Hulls Nos. 181-182, two Design P1-S2-L2 twin screw turbine propulsion transports for U. S. Maritime Commission. Launching dates January 5 and June 8, 1942. Delivery dates September 26 and November 5, 1942.

Thirty-two steel lighters.

GENERAL ENGINEERING & DRY DOCK CO.
Alameda, Calif.

New Construction:

Four anti-submarine net tenders for U. S. Navy.

Four mine sweepers for U. S. Navy.

HARBOR BOAT BUILDING CO.
Terminal Island, Calif.

New Construction:

Hull No. 65, St. George, tuna bait boat for Van Camp Sea Food and Balestreri partners. Length 100′, breadth 25′, depth 11′; 150 gross tons; Fairbanks-Morse diesel, 300 hp; 10 knots speed; cost $160,000. Launched October 6, 1940; **delivery date February 25, 1941.**

Fifteen 60-foot U. S. Navy boats.

LAKE WASHINGTON SHIPYARDS
Houghton, Wash.

New Construction:

Four anti-submarine net tenders.

Four thousand A. S. N. T. floats.

Coast and Geodetic Survey ship.

Six seaplane tenders for U. S. Navy.

LOS ANGELES SHIPBUILDING & DRY DOCK CORP.
Los Angeles, Calif.

New Construction:

Hulls Nos. AR6-AR8, three repair vessels for U. S. Navy.

MOORE DRY DOCK CO.
Oakland, Calif.

New Construction:

Hulls Nos. 197, Mormacsea; and 198, Mormacsun; two C-3 vessels for U. S. Maritime Commission. LOA 492′0″, LBP 465′, breadth molded 69′6″, depth molded 42′6″. **Estimated delivery dates March 1 and March 24, 1941.**

Hulls Nos. 199-200, two caisson gates for Bureau of Yards and Docks; one for D. D. No. 2, Pearl Harbor, T. H.; one for D. D. No. 5, Puget Sound, Wash. 150′ x 22′ x 57′; 1800 tons weight. Delivery date May, 1941.

Hulls Nos. 201-203, three cargo and passenger vessels for U. S. Maritime Commission and Alcoa Steamship Co. 442′ x 62′ x 25′; depth molded to bridge deck 41′6″; 8500 hp; 17 knots speed; passenger carrying capacity 38. Estimated keel laying dates February 3, June 16 and September 10, 1941. Estimated delivery dates January 1, March 15 and June 1, 1942.

Hulls Nos. 204-206, three defense vessels for U. S. Navy and Dravo Corp. 110′ x 34′ x 11′3″ molded depth; two diesel-driven generators.

Two submarine tenders for U. S. Navy.

Five submarine rescue vessels for U. S. Navy.

Six C-2 cargo vessels.

Conversion:

Hull No. 195, U. S. S. Tangier, to seaplane tender for U. S. Navy.

OLSON & SUNDE MARINE WORKS
Seattle, Wash.

New Construction:

One 57-foot combination salmon seine diesel boat for Henry Bowman, Wrangell, Alaska. Cost, with equipment, $24,000. Completion date April 1, 1941.

PACIFIC BRIDGE CO.
San Francisco, Calif.

New Construction:

One seagoing drydock for U. S. Navy. Cost $1,649,000.

PACIFIC DRY DOCK & REPAIR CO.
Oakland, Calif.

New Construction:

One all-welded steel oil barge. 148′ x 38′ x 9′; 300,000 gal. capacity.

Lighters. Cost $284,572.

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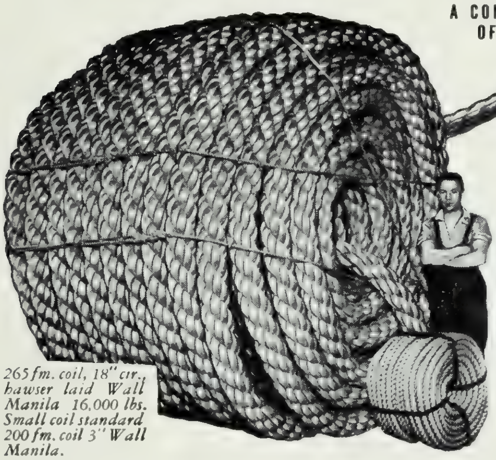

265 fm. coil, 18" cir. hawser laid Wall Manila 16,000 lbs. Small coil standard 200 fm. coil 3" Wall Manila.

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SPECIFIED FOR ALL REQUIREMENTS

Reliable

WALL Manila ROPE

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Heavy duty Marine Cordage, Wrecking Lines, Deep-sea Hawsers, made on the longest rope-walk in the world.

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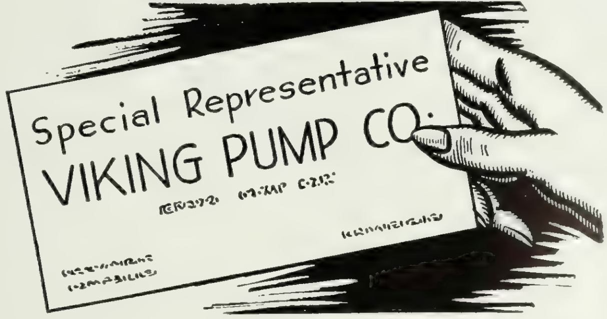
333 Montgomery St., San Francisco, Cal.



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I want to stop long enough to refresh your memory on these vital Viking facts:

All Viking Rotary Pumps operate with only 2 moving parts—here is longer life, less wear, simple servicing, lower power costs. Compactly designed, Viking Pumps fit snugly in tight places, require less floor space, give a neater installation. A wide selection of drive arrangements, mountings and capacities are available in all standard stock models.

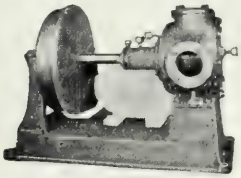

FIGURE 40 — Rugged, compact design. Available in 200, 300, 450, 750 and 1050 GPM sizes End-thrust bearings standard equipment. Furnished with or without motor, Diesel engine, etc. Full details in Bulletin 2100 35. Write for a copy.

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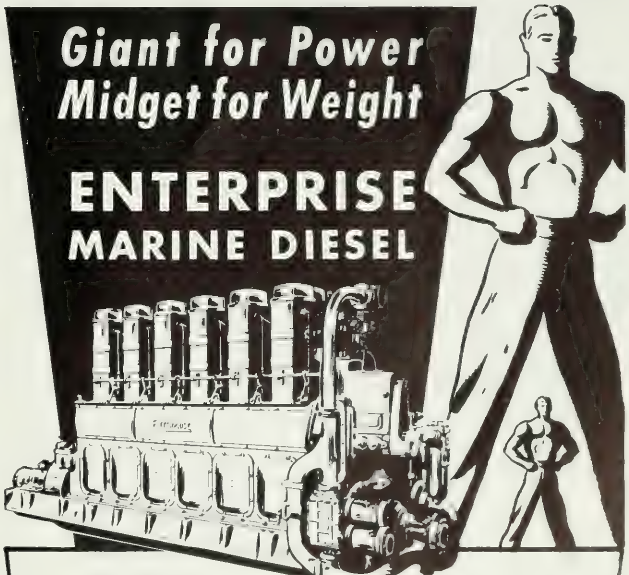
VIKING PUMP COMPANY
CEDAR FALLS, IOWA

Giant for Power
Midget for Weight

ENTERPRISE MARINE DIESEL



During 1940 over 60 per cent of the fishboats, tugs and towboats built in the West were powered with Enterprise Diesels. The answer to *your* power problem may be an Enterprise.

ENTERPRISE
ENGINE & FOUNDRY CO.

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SEATTLE SALES OFFICE: 913 Western Avenue

SEATTLE-TACOMA SHIPBUILDING CORP.
Seattle, Wash.

TACOMA PLANT

New Construction:

Hulls Nos. 1-2; 3, Cape Cleare; 4-5; five C-1 cargo vessels for U. S. Maritime Commission. Single screw, full scantling diesel propulsion type. Two General M.A.N. 2100-hp engines; 14 knots speed. **Launching dates, No. 4, March 1, 1941;** No. 5, April 1, 1941. **Delivery dates, No. 1, March 1, 1941;** No. 2, April 1, 1941; No. 3, May 7, No. 4, July 6, No. 5, September 4, 1941.

Hulls Nos. 6-7, two C-3 shelter deck type cargo steamers for U. S. Maritime Commission. To be converted on completion to U. S. Navy troop ships. Keel laying dates, April 1 and March 15, 1941. Launching dates, August 1 and September 15, 1941. Delivery dates, November 20 and December 29, 1941.

Hulls Nos. 8-11, four C-3 cargo ships for U.S. Maritime Commission. 465′ x 69′6″ x 33′; 8900 tons; 8500-hp steam turbine propulsion; cost $2,900,000. Keel laying dates, August 8, September 22, December 8, 1941, and January 28, 1942. Launching dates, December 1, 1941, and January 20, March 8, May 6, 1942. Delivery dates, February 7, March 19, April 28, June 7, 1942.

SEATTLE PLANT

New Construction:

Twenty-five destroyers for U. S. Navy.

TODD-CALIFORNIA SHIPBUILDING CORP.
Richmond, Calif.

New Construction:

Thirty cargo vessels for British Purchasing Commission. Cost $50,000,000.

TODD-SEATTLE DRY DOCKS
Seattle, Wash.

Conversion work.

WESTERN BOAT BUILDING CO., INC.
Tacoma, Wash.

New Construction:

Hull No. 144, purse seine fishing boat. 95′ x 24′; acquired by U. S. Navy. Launched January 15, 1941.

Hull No. 145, fishing boat. 115′ x 26′. Keel laid October 1, 1940.

Conversion:

Fishing boats Majestic and Mahree Star, conversion to naval use.

WESTERN PIPE AND STEEL CO.
South San Francisco, Calif.

New Construction:

Hulls Nos. 58-61, four C-1 cargo vessels for U. S. Maritime Commission. Full scantling diesel propulsion type; single screw; two Busch-Sulzer 2100-hp engines. **Delivery dates, March 17,** May 16, July 15 and September 13, **1941.**

Hulls Nos. 62-65, four C-3 cargo ships for U. S. Maritime Commission. 492′ x 69′ x 42′6″; 8900 tons; 8500-hp; steam propulsion; $2,990,000 each. Keel laying dates, February 28, May 5, August 1 and September 30, 1941. Launching dates July 15, September 15, December 5, 1941, and January 15, 1942. Delivery dates, February 24, May 5, May 15 and June 24, 1942. All above dates estimated.

Navy life floats.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY
Pittsburgh, Pa.

New Construction:

Ten freight barges for Inland Waterways Corp., St. Louis, Mo. 280′ x 48′ x 11′.

Eight dump scows. 160′ x 50′6″ x 13′6″; for Panama Canal.

Two fueling scows for Carnegie Illinois Steel Co. 125′ x 26′ x 11′.

THE AMERICAN SHIP BUILDING CO.
Cleveland, Ohio

New Construction:

Twelve net tenders for U. S. Navy (6 at Lorain, Ohio; 6 at Cleveland, Ohio). 151′8″ x 30′6″ x 16′6″; diesel-electric propulsion; contract price $6,357,000. Keels laid October 18, 1940.

BATH IRON WORKS
Bath, Maine

New Construction:

Hulls Nos. 182-183, DD437, Woolsey; and DD438, Ludlow; two 1620-ton destroyers for U. S. Navy. Delivery dates May and July, 1941.

Hulls Nos. 184-187, four cargo ships for American Export Line. 400′ x 60′ x 39′. Delivery dates September and October, 1941, and April and June, 1942.

Hulls Nos. 188-189, DD457 and DD458, two destroyers for U. S. Navy. Delivery dates December, 1941, and February, 1942.

Hulls Nos. 190-195, DD449-451, 467-469, six destroyers for U. S. Navy.

Hulls Nos. 196-206, DD507-DD517, eleven destroyers for U. S. Navy.

Hulls Nos. 208-213; DD629-DD631; DD 642-DD644; six destroyers for U. S. Navy.

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POWELL QUALITY
than meets the
BUYER'S EYE!

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The production of ever better valves starts in Powell laboratories, where trained engineers and metallurgists constantly check and change designs . . . accurately test all the metals and alloys that go into Powell products . . . and this scientific proving procedure *prior* to manufacture *is carried through the actual building of the valves* . . . from painstaking skill in making perfect cores, to the strenuous tests required to assure valve satisfaction.

First, delicate, sensitive fingers handle the fine work of making cores for Powell small valves . . . to assure perfect models from which to make perfect valves. Then, in the foundry, each batch of molten metal is carefully tested for its specific job. Third, pouring . . . utmost care is taken to avoid porosity and sand or slag inclusions . . . every single pouring is under the direct supervision of a specially trained craftsman.

There, in a picture, is one phase of modern valve manufacture . . . next month, we'll complete the small valve cycle . . . show where and how the other, more advanced operations are constantly checked to guarantee *"quality, through and through."* Consider this when purchasing your next order of valves . . . specify Powell for value and performance.

You need more than a photograph of the finished product to see all the qualities that make Powell Valves uniquely able to better serve your requirements.

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THE WM. POWELL COMPANY • CINCINNATI, OHIO

BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Division
Fore River Yard
Quincy, Mass.

New Construction:

Hull No. 1478, Massachusetts, 35,000-ton battleship for U. S. Navy. Keel laid July 20, 1939.

Hulls Nos. 1479, San Diego; and 1480, San Juan; two 6000-ton cruisers for U. S. Navy. Keels laid March 27 and May 15, 1940.

Hull No. 1484, cargo vessel for U. S. Maritime Commission. 450′ x 66′ x 42′3″; 16½ knots; geared turbines and water tube boilers; 14,500 tons. Launching date November 16, 1940.

Hulls Nos. 1485-1487, three tankers. 502′ x 68′ x 37′; 21,000 tons. Keels laid July 1, August 7 and September 26, 1940.

Hulls Nos. 1488-1491, four tankers for Sinclair Refining Co. 10,700 tons dwt. Keel laid, No. 1488, November 21, 1940.

Hulls Nos. 1492-1493, two tankers for Sinclair Refining Co. 15,450 tons dwt.

Hulls Nos. 1494-1497, four heavy cruisers for U. S. Navy.

Hulls Nos. 1498-1501, four light cruisers for U. S. Navy.

Hulls Nos. 1502-1503, two light cruisers for U. S. Navy.

Hulls Nos. 1504-1507, four heavy cruisers for U. S. Navy.

Hulls Nos. 1508-1511, four aircraft carriers for U. S. Navy.

Hulls Nos. 1512-1515, four trawlers.

Hulls Nos. 1516-1519, four 1650-ton destroyers for U. S. Navy.

BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Division
Sparrows Point Yard
Sparrows Point, Md.

New Construction:

Hulls Nos. 4341, Robin Locksley; 4342, Robin Doncaster; 4343, Robin Kettering; three cargo vessels for Seas Shipping Co. LOA 485′, beam 66′, draft 43′. Launching dates, No. 4341, October 5, 1940; No. 4342, December 7, 1940; No. 4343, January 18, 1941.

Hulls Nos. 4346, Thompson Lykes; 4347-4348; three C-1 cargo vessels. LOA 417′, LBP 395′, beam 60′, depth 37′6″. Launching date, No. 4346, December 21, 1940.

Hulls Nos. 4350-4352, three cargo vessels for Seas Shipping Co. 450′ x 66′ x 34′; 6300 hp; 8500 gross tons.

Hulls Nos. 4353-4356, four oil tankers for Socony Vacuum Oil Co. 487′6″ x 68′ x 37′; 12,000 hp; 9,800 gross tons.

Hull No. 4357 oil tanker for Union Oil Co. of Calif. 442′ x 63′ x 34′10″; 3500 hp; 8000 gross tons.

Hulls Nos. 4358-4359, two oil tankers for Socony Vacuum Oil Co. 487′6″ x 68′ x 37′; 12,000 hp; 9800 gross tons.

Hulls Nos. 4360-4361, two oil tankers for Union Oil Co. 442′ x 64′ x 34′10″; 3500 hp; 8000 gross tons.

Hulls Nos. 4362-4364, three cargo and passenger vessels for Mississippi Shipping Co. 465′ x 65′6″ x 39′9″; 8600 hp; 8300 gross tons.

Hull No. 4365, oil tanker for Richfield Oil Co. 442′ x 64′ x 34′10″; 3500 hp; 8000 gross tons.

Hulls Nos. 4367-4368, two oil tankers for Panama Transport Co. 487′6″ x 68′ x 37′; 7000 hp; 9800 gross tons.

Hull No. 4369, oil tanker for Continental Oil Co. 442′ x 64′ x 34′10″; 3500 hp; 8000 gross tons.

Hulls Nos. 4371-4372, two oil tankers for Gulf Oil Co. 442′ x 64′ x 34′10″.

BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Division
Staten Island Yard
Staten Island, N. Y.

New Construction:

Hulls Nos. 8015-8019, five C-1-B design cargo vessels for U. S. Maritime Commission. 417′9″ x 60′ x 37′5″. **Launching dates,** No. 8016, November 2, 1940; No. 8017, December 28, 1940; **No. 8018, March 13, 1941;** No. 8019, April 15, 1941. **Delivery dates, February 25,** April 1, June 1, August 15 and October 1, 1941.

Hulls Nos. 8021-8022, two destroyers for U. S. Navy.

Hulls Nos. 8023-8032, ten destroyers for U. S. Navy.

IRA S. BUSHEY & SONS, INC.
Brooklyn, N. Y.

New Construction:

Hull No. 486, tug. 100′; 805-hp F-M diesel. Delivery date, May, 1941.

Hull No. 490, tug. 90′; 805-hp F-M diesel. Delivery date, July, 1941.

Hull No. 491, wooden drydock section for Bethlehem Steel Co. Delivery date April 15, 1941.

Hull No. 493, tug. 100′; 805-hp F-M diesel. Delivery date, May, 1941.

Hull No. 494, tug. 90′; 805-hp F-M diesel. Delivery date, July, 1941.

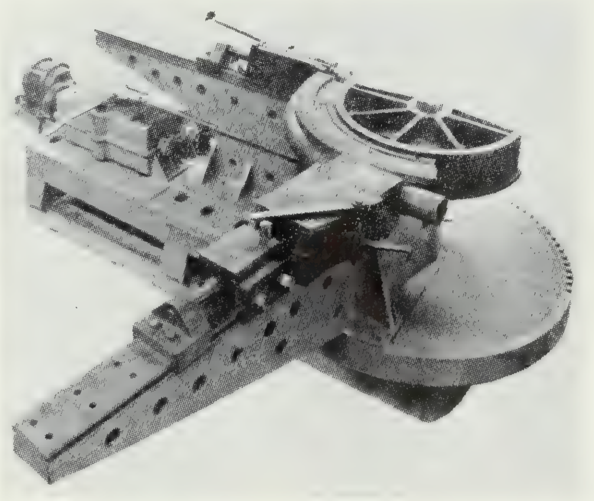
Hull No. 496, tug. 90′; 805-hp F-M diesel.

Hull No. 497, tug. 90′; 805-hp F-M diesel.

Hull No. 498, 156-foot oil tanker.

Hull No. 499, 156-foot oil tanker.

SHIPYARDS: - -
MEET THE CHAMP
Over 20 Years in the Field Without a Failure



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U. S. PIPE BENDER
Will Cut Your Bending Costs.
Bend them faster; bend them cold.
All Sizes Up To 24″ Capacity.
This machine is the finest, most productive bending machine yet built.

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CRAMP SHIPBUILDING COMPANY

Philadelphia, Pa.

New Construction:

Six cruisers, Cleveland class, for U. S. Navy.

DEFOE BOAT & MOTOR WORKS

Bay City, Mich.

New Construction:

Hull No. 167, PC452, sub-chaser for U. S. Navy. 174′ long. Delivery date May, 1941.

Hulls Nos. 168-170, YT149-YT151, three harbor tugs for U. S. Navy. 100′ long. Delivery date, May 1, 1941.

Hulls Nos. 171-174, four mine sweepers for U. S. Navy. 220′ long.

Twelve 165-foot escort vessels for U. S. Navy.

THE DRAVO CORPORATION

Engineering Works Division

Pittsburgh, Pa., and Wilmington, Del.

New Construction:

Hulls Nos. 1700-1701, two welded carfloats for Pennsylvania R. R., Philadelphia, Pa. 250′ x 34′ x 9′1″; 1188 gross tons.

Hulls Nos. 1748-1749, two type W-7 welded coal barges for stock. 175′ x 26′ x 10′8″; 944 gross tons.

Hull No. 1751, 760-hp twin-screw diesel towboat for stock. 145′ x 27′ x 11′9″; 318 gross tons.

Hulls Nos. 1768-1775, 1846-1853, sixteen steel lighters for U. S. Navy Dept., Washington, D. C. 110′ x 34′ x 11′3″; 5344 gross tons.

Hulls Nos. 1776-1780, five covered cargo barges for stock. 175′ x 26′ x 11′; 2650 gross tons.

Hulls Nos. 1785-1790, six sand and gravel barges for Keystone Sand Division. 135′ x 27′ x 8′; 1530 gross tons.

Hulls Nos. 1791-1795, five covered cargo barges for stock. 175′ x 26′ x 11′; 2650 gross tons.

Hull No. 1796, deck barge for Arundel Corp., Baltimore, Md. 110′ x 34′ x 11′3″; 334 gross tons.

Hulls Nos. 1797-1814, eighteen gate vessels for Bureau S. & A., Navy Dept., Washington, D. C. 5580 gross tons.

Hull No. 1815, one fabricated steel hull oil barge for Pacific D. D. & Repair, San Francisco, Calif. 195′ x 35′ x 9′9″; 598 gross tons.

Hulls Nos. 1816-1830, fifteen type W-7 welded steel bulk cargo barges for stock. 175′ x 26′ x 10′8″; 7080 gross tons.

Hulls Nos. 1831-1834, four welded steel oil barges for stock. 195′ x 35′ x 9′9″; 2392 gross tons.

Hulls Nos. 1835-1840, six escort vessels for U. S. Army, Washington, D. C. 2010 gross tons.

Hulls Nos. 1841-1845, five double-bottom covered cargo barges for stock. 175′ x 26′ x 11′; 2650 gross tons.

Hulls Nos. 1854-1855, two welded steel deck barges for Newport News S. B. and D. D. Co. 40′ x 20′ x 4′; 52 gross tons.

Hulls Nos. 1856-1861, six sand and gravel barges for Keystone Sand Division. 135′ x 27′ x 8′; 1530 gross tons.

THE FEDERAL SHIPBUILDING AND DRY DOCK COMPANY

Kearny, N. J.

New Construction:

Hulls Nos. 122-127, six destroyers for U. S. Navy.

Hull No. 167, C-3 cargo vessel for U. S. Maritime Commission. **Delivered February 7, 1941.**

Hulls Nos. 168-169, CL51, Atlanta; and CL52, Juneau; two 6000-ton cruisers for U. S. Navy. Keels laid April 22 and May 27, 1940.

Hulls Nos. 179-186, eight C-2 cargo ships for U. S. Maritime Commission. Keel laid, No. 179, December 27, 1940.

Hulls Nos. 187-188, two cargo vessels for Matson Navigation Co. Keels laid November 12 and 22, 1940.

Hull No. 189, one tanker for Pan American Petroleum and Transport Co. 13,000 dwt tons. Launching date, January 31, 1941.

Hulls Nos. 190-193, four tankers for Sinclair Refining Co. 15,000 dwt. Keel laid, No. 190, November 12, 1940.

Hulls Nos. 194-197, four destroyers for U. S. Navy. Keels laid, Nos. 194-195, December 2, 1940; Nos. 196-197, December 16, 1940.

Hulls Nos. 198-203, six destroyers for U. S. Navy.

Hulls Nos. 204-205, two destroyers for U. S. Navy.

Hulls Nos. 206-213, eight destroyers for U. S. Navy.

Hulls Nos. 214-218, five destroyers for U. S. Navy.

Hulls Nos. 219-221, three cruisers for U. S. Navy.

Hull No. 228, one C-2 cargo ship for U. S. Maritime Commission.

Hulls Nos. 229-230, two destroyers for U. S. Navy.

Hulls Nos. 231-232, two destroyers for U. S. Navy.

GULF SHIPBUILDING CORP.

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New Construction:

Four 2100-ton destroyers for U. S. Navy.

Four vessels for Waterman Steamship Corporation. 445′ x 63′ x 40′6″; shelter deck type; geared turbine drive; 15½ knots service speed.

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Port Arthur, Texas

New Construction:

Hulls Nos. 167-168, two diesel-electric tugs for General Motors Corp. 100′ x 24′ x 12′4″; 1000 shp G. M. diesel and auxiliary each. Delivery dates, No. 167, April, 1941; No. 168, May, 1941.

Hull No. 176, diesel tug for General Motors Corp. 100′ x 24′ x 12′4″; 680 hp. Delivery date, July 30, 1941.

Hull No. 177, diesel tug for Deepwater Oil Terminals Co., Houston, Tex. 70′ x 18′ x 10′5″; 400 hp. Delivery date April 30, 1941.

Hulls Nos. 181-184, four oil barges for Butcher-Arthur Corp., Houston, Texas. 150′ x 28′ x 8′.

Hulls Nos. 185-187, three oil barges for Butcher-Arthur Corp., Houston, Texas. 165′ x 36′ x 10′9″.

Hull No. 189, diesel tug for General Motors Corp., 100′ x 24′ x 12′4″; 680 hp. Delivery date, August 30, 1941.

THE INGALLS SHIPBUILDING CO.

Pascagoula, Miss., and Decatur, Ala.

Pascagoula

New Construction:

Hulls Nos. 255-256, two C-3 cargo vessels. Completion dates, March and May, 1941.

Hulls Nos. 268, 297-299, four C-3-IN passenger-cargo vessels for U. S. Lines. Completion dates May, November, December, 1942; and February, 1943.

Hulls Nos. 265-267, three C-3-P passenger-cargo vessels for American-South African Line, Inc. Completion dates November, December, 1941; and January, 1942.

Hulls Nos. 293-296, four C-3-S-A-2 cargo vessels for U. S. Maritime Commission. Completion dates February, March, May and June, 1942.

Decatur

New Construction:

Hull No. 292, service barge for U. S. E. D., St. Louis, Mo. 274′ x 40′ x 7′5⅝″.

Hulls Nos. 304-306, three grain barges for Tennessee Valley Sand & Gravel Co., Sheffield, Ala. 175′ x 26′ x 11′.

Hull No. 308, oil barge for Independent Oil Co., Dothan, Ala. 195′ x 35′ x 9′9″.

Hull No. 309, landing barge for Government of Venezuela. 295′ x 49′3″ x 7′6″; barge No. 1.

Hull No. 310, landing barge for Government of Venezuela. 147′6″ x 34′6″ x 7′6″; barge No. 2.

Hull No. 311, landing barge for Government of Venezuela. 60′ x 34′6″ x 5′; barge No. 3.

Hull No. 312, ferry float and ramp for Government of Venezuela. 24′ x 30′ x 5′.

Hulls Nos. 313-314, two sand and gravel barges for stock. 110′ x 26′ x 6′6″.

LEVINGSTON SHIPBUILDING CO.

Orange, Texas

New Construction:

Hull No. 160, tug for General Motors Corp. 85′ x 22′ x 9′; 800-hp diesel.

Hull No. 185, tug for U. S. Navy.

Hull No. 186, tug for U. S. Navy.

Hulls Nos. 187-188, 199, three tugs for River Terminals Corp. 85′ x 23′ x 9′6″; 600-hp Cooper-Bessemer engines.

Hulls Nos. 190 and 196, two tugs for stock. 74′ x 20′ x 9′; 400-hp diesels.

Hull No. 191, barge for U. S. Navy.

Hulls Nos. 192-193, two 8600-bbl barges for stock.

Hulls Nos. 194-195, two tugs for stock. 66′ x 17′ x 7′7″.

Hulls Nos. 197-198, two 10,000-bbl stock barges (oil).

MANITOWOC SHIP BUILDING CO.

Manitowoc, Wis.

New Construction:

One steel twin-screw carferry. 406′ x 57′ x 23.6′. **Delivery date, March 10, 1941.**

JOHN H. MATHIS CO.

Camden, N. J.

New Construction:

Four anti-submarine net tenders for U. S. Navy.

One bulk carrier tanker 265′ long for Thos. Bowes, N. A.

NEWPORT NEWS SHIPBUILDING & DRYDOCK CO.

Newport News, Va.

New Construction:

Hull No. 372. Sold to U. S. Navy for conversion to naval auxiliary. Gross tonnage about 11,500 tons; LBP 525′, breadth molded 75′, depth molded 39′. Launched September 18, 1940.

Hull No. 378, battleship 58, Indiana, for U. S. Navy. Keel laid November 20, 1939.

Hulls Nos. 381-384, four single screw combination passenger and cargo vessels for U. S. Maritime Commission. 465′ x 69′6″ x 42′6″; gross tonnage about 9100 tons. **Delivery dates, No. 381, February, 1941;** No. 382, April, 1941; No. 383, June, 1941.

Hull No. 385, aircraft carrier No. 8, Hornet, for U. S. Navy. Launched December 14, 1940.

Hull No. 386, single-screw combination passenger and cargo vessel for U. S. Maritime Commission. 465′ x 69′6″ x 42′6″; gross tonnage about 9100 tons. Delivery date October, 1941.

Hulls Nos. 387-388, two single-screw cargo vessels for Matson Navigation Co. 465′ x 69′6″ x 42′6″; gross tonnage about 7,700. Delivery dates May 25 and July 1, 1941.

Hull No. 389, one single-screw cargo vessel for International Freighting Corp., Inc. 435′ x 63′ x 40′6″; gross tonnage about 8,000. Delivery date August 1, 1941.

Hulls Nos. 390-391 (CL62-CL63), two light cruisers for U. S. Navy.

Hulls Nos. 392-394 (CV9-CV11), three aircraft carriers for U. S. Navy.

Hulls Nos. 395-398 (CV12-CV15), four aircraft carriers for U. S. Navy.

Hulls Nos. 399-400 (CL80-CL81), two light cruisers for U. S. Navy.

THE PUSEY & JONES CORP.
Wilmington, Del.

New Construction:

Hull No. 1076, C-1 cargo vessel for U. S. Maritime Commission; 413′ x 60′ x 37′6″; 5000 gross tons; turbine propulsion; 4000 hp; 14 knots speed. **Delivery date, March, 1941.**

Hulls Nos. 1080-1081, two automobile and passenger ferries for Delaware-New Jersey Ferry Co. 206′ x 65′ x 16′; 750 gross tons; Una-Flow steam machinery; 1400 shp; 15 mph speed. **Launching date, February 1, 1941.**

Hulls Nos. 1082, Hains; and 1083, Hoffman; two seagoing hopper dredges for War Dept., U. S. Engineers Office, Philadelphia, Pa. 215′10½″ x 40′ x 15′6″; approx. 2000 gross tonnage; diesel-electric propulsion, 950 shp. Delivery dates, February and August, 1942.

SUN SHIPBUILDING AND DRY DOCK COMPANY
Chester, Pa.

New Construction:

Hulls No. 186, Rio Hudson; No. 187, Rio Parana; No. 188, Dio de la Plata; No. 189, Rio de Janeiro; four C-3 cargo and passenger liners for Moore-McCormack Lines. 492′ x 69′6″ x 42′6″; 8500 gross tons; diesel propelled; 8500 shp; 16½ knots. Delivery dates, August, September, October and November, 1941.

Hulls Nos. 199-206, eight C-2 cargo vessels for U. S. Maritime Commission. 474′ x 63′ x 40′6″; 7400 gross tons; diesel propelled; 7500 shp; 16 knots.

Hull No. 207, Esso Williamsburg, tanker for Panama Transport Co. 547′3″ x 70′ x 40′; 11,300 gross tons; diesel propelled; 7500 shp; 15 knots. Delivery date, April, 1941.

Hulls Nos. 208-210, three tankers for Petroleum Shipping Co. 520′ x 68′ x 37′; 10,400 gross tons; turbine; 4000 shp; 13 knots.

Hull No. 211, tanker for Atlantic Refining Co. 543′10″ x 70′ x 40′; 11,600 gross tons; turbo-electric; 5000 shp; 13 knots. Delivery date, April, 1941.

Hull No. 212, tanker for Sun Oil Co. 547′3″ x 70′ x 40′; 11,300 gross tons; diesel propelled; 7500 shp; 15 knots. **Delivery date, March, 1941.**

Hulls Nos. 213-216; 219-220, six tankers for Panama Transport Co. 547′3″ x 70′ x 40′; 11,400 gross tons; 7500 shp; 15 knots speed.

Hulls Nos. 217-218, two tankers for Standard Oil Co. of N. J. 547′3″ x 70′ x 40′; 11,400 gross tons; 7500 shp; 15 knots speed.

Hulls Nos. 221-222, two tankers for Keystone Tankship Corp. 520′ x 68′ x 37′; 10,600 gross tons; turbine; 12,000 shp; 16½ knots. Keel laying dates, November 15 and December 15, 1941. Launching dates, June 15 and July 15, 1942.

Hulls Nos. 223-225, three tankers for The Texas Co. 513′10″ x 68′ x 36′; 9300 gross tons; turbine; 9000 shp; 16 knots.

Hull No. 226, tanker for Kaymar Tankship Corp. 520′ x 68′ x 37′; 10,600 gross tons; turbine; 12,000 shp; 16½ knots. Keel laying date, April 5, 1942. Launching date, August 28, 1942. Delivery date, November, 1942.

Hulls Nos. 227-228, two tankers for Seamar Tankship Corp. 520′ x 68′ x 37′; 10,600 gross tons; turbine; 12,000 shp; 16½ knots. Keel laying dates, May 5 and June 5, 1942. Launching dates, September 28 and October 28, 1942. Delivery dates, December, 1942, and January, 1943.

Hull No. 229, tanker for Atlantic Refining Co. 543′10″ x 70′ x 40′; 11,600 gross tons; turbo-electric; 5000 shp; 13 knots.

Hull No. 230, tanker for Atlantic Refining Co. 474′ x 65′ x 37′; 8000 gross tons; turbo-electric; 5000 shp; 14½ knots.

Hulls Nos. 231-232, two tankers for Keystone Tankship Corp. 520′ x 68′ x 37′; 10,600 gross tons; turbine; 12,000 shp; 16½ knots.

Hull No. 234, tanker for Sun Oil Co. 547′3″ x 70′ x 40′; 11,400 gross tons; diesel propelled; 7500 shp; 15 knots.

Hull No. 235, tanker for Standard Oil Co. of N. J. 547′3″ x 70′ x 40′; 11,400 gross tons; turbine; 7500 shp; 15 knots.

Hull No. 236, tanker for Atlantic Refining Co. 543′10″ x 70′ x 40′; 11,600 gross tons; turbo-electric; 5000 shp; 13 knots.

TAMPA SHIPBUILDING CO.
Tampa, Fla.

New Construction:

Hull No. 36, C-2 type cargo vessel for U. S. Maritime Commission. 459′ x 63′ x 31′6″; 9291 dwt tons; diesel powered. **Delivery date, March, 1941.**

Hulls Nos. 37-40, four C-2 type cargo vessels for U. S. Maritime Commission. 459′ x 63′ x 31′6″; 9291 dwt tons.

TODD-BATH IRON SHIPBUILDING CORP.
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Aids to Navigation

(Continued from page 53)

beacon bearings, regardless of visibility or wind and noise.

The long experience of large numbers of mariners indicates that bearings on radiobeacons can be obtained with an accuracy of ½ to 2 degrees, depending considerably on the user and conditions on the ship and the instrument used. Radiobeacons are operated semi-continuously in clear weather to permit mariners to take frequent observations and are operated steadily when obscure conditions exist in the vicinity of the radiobeacon. Frequent radiobeacon bearings are therefore possible and when so used the probability of observational error is minimized. In general, the possibility of obtaining bearings accurate to within two degrees is reasonably supported. Analysis of several thousands of bearings made in actual service has showed average bearings well within this accuracy.

There are two types of errors in radiobeacon bearings which are to some extent governed by the radiobeacon establishment. These errors are generally known as "land" errors and "night" errors. These have been minimized by careful selection of the radiobeacon sites and by certain precautions in the design of the radiobeacon station equipment. Experience over a period of years has continued to minimize the practical effect of these two types of errors. There are several other possible sources of error but these are governed largely by the equipment and conditions on the vessel taking the bearings and consequently are not within the control of the agency establishing the radiobeacons.

Radio-Sound Distance Finding Signals

Following some preliminary tests there was established at Cape Henry Lighthouse, Virginia, in early 1929, an apparatus for synchronizing the emissions of the sound-in-air fog signal and the radiobeacon which was the first regular marine aid of this type in the world. This aid was generally received with favor by mariners and it has rapidly been extended to almost all radiobeacons where the sound signal adjacent to the radiobeacon station could effectively reach the navigable waters served by the radiobeacon. Approximately two-thirds of all of the United States radiobeacons are now equipped with this aid. Any mariner can use this aid without additional equipment, if he has a radio direction finder on board. The accuracy of the distance measured by such means is in practice well within 10 per cent and it has come to be widely used by mariners.

The means of observation is very simple, the mariner simply listens to the regular radiobeacon transmission, and, if the sound-in-air fog signal is operating at the same time, he will hear a distinctive short and long signal during the radiobeacon transmission. He then merely times the interval between this distinctive radio signal and a duplicate of the signal which arrives shortly thereafter from the sound-in-air signal. The interval in seconds divided by 5 is the distance in statute miles. This measurement, giving distance from a known aid, coupled with a radiobeacon bearing, provides a "fix" of the vessel position.

This system almost provides an ideal navigation system but the chief limitation is the variable effective range of the sound-in-air signal under adverse conditions and consequently it is useful only when the sound-in-air signal is heard at sufficient distances.

Marker Radiobeacons

When the sound-in-air signal is not heard, the use of two or more radiobeacon bearings are necessary to provide a "fix." Since there are many harbor entrances and channels where careful approach is required and where it is not practical to establish the large structures to house the powerful sound-in-air signal equipment which would supplement existing radiobeacons, the United States Coast Guard has for several years been intensively investigating the possibility of using small automatic radiobeacons which could be located on pierheads, piling structures and even on buoys. A number of such radiobeacons are now in use and are termed "marker radiobeacons." They are not intended for long range accurate bearings but serve rather as local marks to indicate channel entrances, turning points and pierheads. Frequently they are located where they will indicate a beam bearing indication on courses already provided by major radiobeacons.

The most difficult development of equipment for use in this connection was the evolution of the buoy radiobeacon equipment. In its present state of development the buoy radiobeacon will provide a signal with a useful range of four to six miles with the average radio direction finder. At these relatively short distances, a rapid swing of the shipboard radio direction finder will provide a bearing which does not need to be accurate within more than five or ten degrees to indicate accurately the relative position of the ship with respect to buoy or fixed structure on which the marker radiobeacon is located.

The marker radiobeacons operate continually in all weather and with their constant usage in clear weather the mariner is soon able to rely on these new radio aids in time of poor visibility in the same way that he uses the corresponding visible aids in clear weather. The cost of the buoy radiobeacon equipment is not great in comparison with the cost of the buoy structure itself and the usual lighting equipment provided on major buoys but the maintenance cost for the radiobeacon buoy is considerably higher at present because of the frequency with which the storage batteries must be replenished when radio beacon equipment is provided. Approximately three months' service can be expected from a large buoy between each battery recharging as compared with six to twelve months for a buoy with only a light. In spite of this considerable increase in maintenance it is now considered probable that the use of buoy radiobeacons will expand rapidly, now that the equipment is sufficiently developed. The reliability of the equipment is rather high as indicated by service experience to date and the installation on each buoy consists of two complete independent radio equipments which transmit alternately, so that in the event of failure of one unit the signals continue without interruption but with longer intervals between signal groups.

Radiobeacon Equipment

The cost of a radiobeacon station is less than that of a powerful fog signal station emitting sound-in-air signals. Both types of signals require approximately the same type of housing and attendance. The actual cost of establishing a radiobeam signal varies between approximately $1500 and $15,000, depending on the range desired and the availability of electric power supply, exclusive of housing for equipment and attendants.

The radiobeacon antenna or radiating structure is an important consideration and particular attention is given to the design of this part of the equipment. Where practicable, vertical structural steel towers with insulated bases are used. On lightships and on many fixed structures it is necessary to use wire antenna systems

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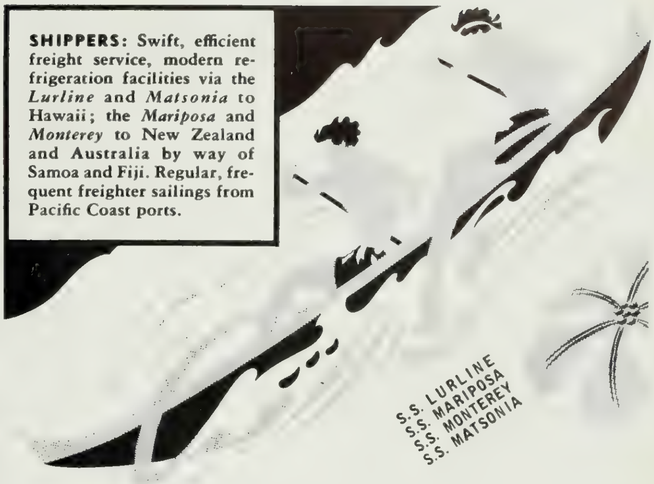

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but in all cases it is necessary to take particular steps to insure suitable radiation pattern and maximum reliable service area. In many instances the radiobeacon antenna is located a distance of several hundred feet from the buildings housing the other equipment. In such cases the radio power is conducted through a special type of cable to the radiating antenna and the cable is buried underground to prevent undesirable radiation from the cable.

The radiobeacon transmitters range from approximately 5 watts to 1000 watts in output power and are in United States radiobeacons almost universally rigidly controlled as to emitted frequency by means of quartz piezo electric crystals. All radiobeacon signals are modulated with an audio tone and a large part of the transmitters emit a signal that is modulated by an accurately controlled audio frequency generator of the tuning fork type. The transmitters are specially designed for rapid servicing under adverse field conditions and many of the larger units are made in sections which are each readily removed and replaced without special tools. Practically all attended radiobeacons are handled by personnel unskilled in radio and except for periodic inspection by technicians it is necessary for the equipment to be so constructed as to permit safe and prompt replacements of parts by the unskilled attendants.

The operation of radiobeacons is almost entirely automatic and the timing and control apparatus represents a considerable part of the equipment at the average radiobeacon. Master clocks maintain the emissions at scheduled times to within a few seconds of standard time and these master clocks are regulated frequently with radio-received time signals. The master clock controls a secondary timing device having a considerable number of cam-operated switches operating at various speeds to control the multiple operation of signals at the typical lighthouse. Many of these operations involve fractional second timing control and the timing devices have been specially developed over a period of years for their particular purpose.

The entire equipment at a radiobeacon station is installed in duplicate and the manual supervisory controls are concentrated at a single control panel that permits the attendant to shift immediately from one set of equipment to the other so that signals can be continued without interruption during necessary repairs or routine maintenance work on one set of equipment.

An automatic warning device is provided which will sound an alarm on failure of the radiobeacon signal and the same device contains visual and aural indicators to permit the attendant to verify the quality, strength and characteristics of the emitted signal.

In addition to the local supervisory apparatus at each radiobeacon there are strategically located radiobeacon monitoring stations located at intervals along the coast to observe regularly the operation of radiobeacons in each area so that any defects developed in these aids to navigation are promptly observed and corrected.

The source of electric power supply for the operation of radiobeacons is the usual public utility power where available. Such power is, however, always duplicated by an emergency plant at the radiobeacon site so that power is available whether or not the utility supply is interrupted. Usually the emergency plant is arranged to start automatically when required. On lightships and at many shore radiobeacon sites there is no public utility power available and steam or internal combustion engines are used to generate the required power. These are usually combined with storage battery banks to provide a continuous source of power without necessitating continuous operation of the engines. Many of the engine-generator and battery combinations are wholly automatic and arranged to provide the necessary power in the amounts required by the demand with only routine maintenance attention on the part of the attendant.

Distant Control of Navigational Aids by Radio

At off-shore sites of navigational aids a large portion of the cost of both the original construction and the maintenance is required to provide living quarters and other facilities for attendants. Since many navigational aids of this type are within visual range of suitable shore dwellings or other attended navigational aids, it is possible to accomplish considerable economy and improvement in the general system of aids by utilizing radio control for the operation of these aids from convenient points. In the case of aids using small amounts of power, such as minor lights and fog bells, it is economical to allow them to operate continuously, but large sound-in-air signals and radiobeacons require considerable power and it is necessary to provide means of controlling their operation so that they are consuming fuel only when actually required. The United States has used radio control for this purpose for over ten years but the cost of equipment which would provide a sufficiently high degree of reliability in this service has made it necessary to apply this principle rather slowly. Today there are a number of such aids in regular use. The controlled aid may consist of a typical off-shore structure with powerful light, fog signal and radiobeacon and it is wholly unattended except for routine inspection and maintenance visits. It is controlled from a suitable shore point where the cost of erection of suitable housing for the attendants is comparatively small and their comfort and living conditions are relatively favorable. The distance of the control is usually around ten miles but may easily be more or less. The shore attendant maintains a lookout and by simple push-button control he turns on or off the fog signal at the remote point and controls the other essential signals there. He has supervision of the apparatus there by means of radiophone apparatus that transmits to him from the remote point the sounds of the engine generator plant in operation, the sound-in-air signal and the other necessary signals to permit his complete assurance of the proper operation of the remote aids under his control. His control circuits permit him to turn on or off the duplicate remote equipment at will so that the signals can be maintained at all times to guard navigation properly.

Current Developments and Trends in Radio Aids to Marine Navigation

The marine radiobeacon system originally planned by the United States in 1924 has been systematically carried to the present stage of development until there is now a system of radiobeacons along the coasts of the United States and the Great Lakes which is fairly complete so far as respects marking the principal points and entrances. It is not possible at this time to predict accurately what additional needs may arise, particularly as respects the provision of local radio aids and minor signals in protected waterways.

The equipment of ships with radio direction finders has steadily continued and as less expensive products of this type have become generally available to the marine public a rapid increase in the use of radio aids by smaller vessels has been observed. It is not probable that as a result of anything now in sight the extensive system of sound fog signals and visual signals can be completely dispensed with as these are of great value to vessels

(Page 84, please)

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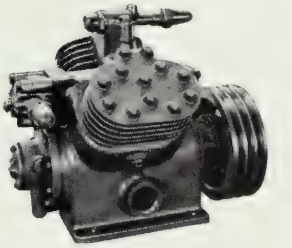

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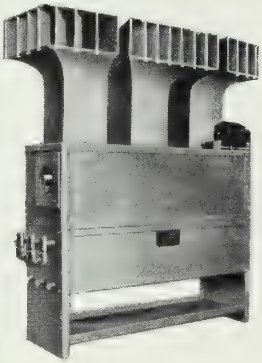

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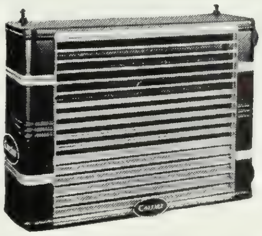

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The new exhaust head incorporates the principles of the Cochrane baffle-type steam separators used for removing oil and moisture from steam lines. Exceptional port area produces low steam velocity and minimizes pressure loss. Steam is whipped sidewise and causes projection of entrainment against ribbed baffle surfaces. The high ribbed baffles exert a scrubbing action in addition to the centrifugal purging force. The exhaust head is of one piece semi-steel construction for 4 to 12 inch sizes and of welded plate for larger sizes. Publication 2960, recently revised with installation photographs, contains complete engineering data, dimensions and list prices.

The Linameter, Publication 2100, the Cochrane Corporation.

The U. S. Patent Office granted on December 19, 1940, to Cochrane Corporation, Philadelphia, their request for registration of the trademark, "Linameter." The new Cochrane Linameter is an area-type flow meter particularly adapted to the measurement of fluids having extraordinary characteristics of viscosity, corrosiveness and solubility, such as fuel oil, ammonia, hot tar, acids, foodstuffs and so on. These characteristics are beyond the scope of the conventional orifice-type flow meter.

Among the features which distinguish this meter are omission of U-tubes, mercury and pressure connecting lines; uniformly graduated indicator and chart scales; reliable integration; wide range of available capacities; negligible pressure loss; ability to locate the meter body against adjacent valves and fittings without the necessity of straight pipe runs; and high accuracy at both high and low percentage scale readings.

It is made in different combinations of indicating, recording and integrating features to suit particular conditions, and may be equipped with pressure and temperature elements to record on the same chart with flow. Styles are available for wall, column or flush panel mounting.

Sight Glasses, Publication 2970, the Cochrane Corporation.

The six sight glass fittings announced by Cochrane Corporation last year have been supplemented by five smaller sizes with screwed connections. Sizes range from ¾ in. to 2 in. for the new screwed connection fittings, and from 2½ in. to 8 in. for the flanged design. Bodies are of cast iron for pressures to 125 lb. per sq. inch. Pyrex windows are held in place by gasketed steel frames. Weights have been reduced on all sizes. Complete information, including prices, are given in their leaflet.

Marine Micarta for Stern Bearings, Westinghouse publication B-2258. A twelve-page, profusely illustrated booklet which shows in graphs and text the advantages of Micarta for stern tube bearings and for bushings on rudder pintles. This material is already in service for these purposes on more than four hundred ships.

Bearings and bushings may be had in either the solid tube or the stave built-up type. Micarta is of uniform quality; will not sliver, crack or splinter; is readily worked with ordinary tools; can be stored dry without danger of splitting, warping or checking; resists galvanic action; has comparatively high tensile, compressive and impact strength; and does not swell

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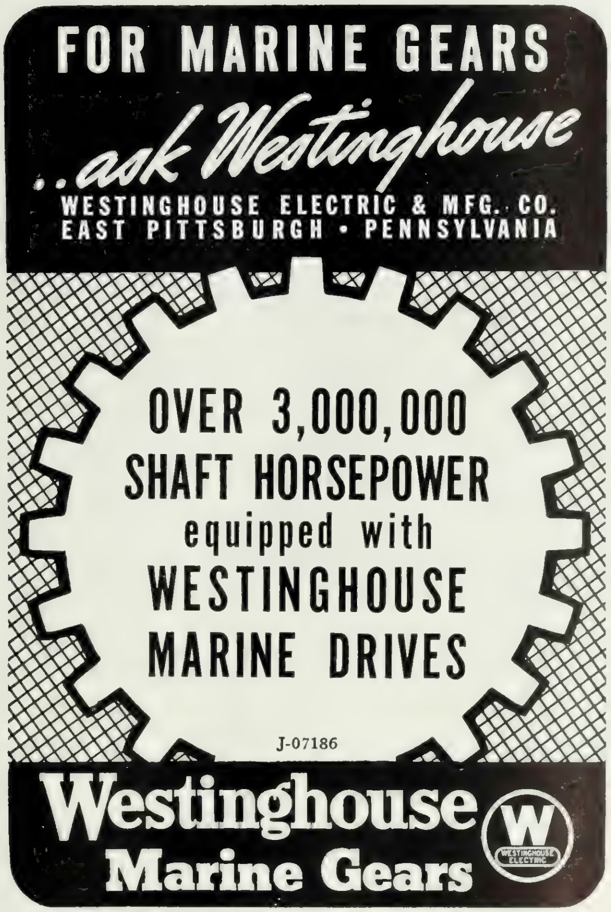
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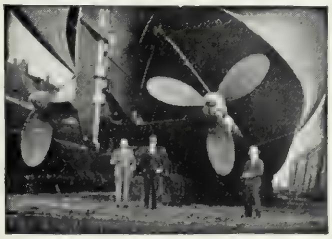

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when immersed in water. It wears evenly and smoothly, and polishes the shaft.

Quimby Screw Pumps, Bulletin S-203. An eight-page catalog section published by the Quimby Pump Company and describing their gear-in-head-type screw pumps. Profusely illustrated with half tones showing various applications, this catalog gives graphs showing test results, and tables and drawings showing specifications, capacities and overall dimensions.

Aluminum Ladders—A new 44-page catalog, describing many types of aluminum ladders, has just been issued by the Aluminum Ladder Company, Tarentum, Pennsylvania. In addition to the usual broad selection of ladders for fire fighting, industrial and commercial use, the new catalog includes data on aluminum gangways, stages, scaffolding, conveyors and many special applications.

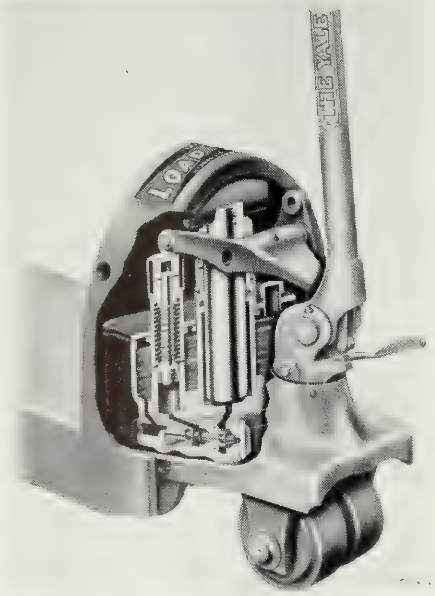
Some of the special ladders outlined are a portable entrance ladder which weighs only one-half lb. per foot of length; a channel ladder which is hinged in the middle, for easy storage; and a telescoping ladder made up of short lengths which can be easily connected to form one complete unit up to 26 feet long.

The catalog also contains interesting general information relative to the strength, durability and utility of aluminum ladders and gangways.

The "Load King" Hydraulic Hand Lift Truck

After years of experimental design and numerous grueling field tests, the engineers of The Yale & Towne Manufacturing Company now offer industry a perfectly balanced hydraulic hand lift truck—the "Load King" hydraulic truck—built for continuous heavy-duty service in capacities of 3500, 5000, 6000 and 8000 lbs.

The hydraulic lifting unit is self-contained and totally enclosed—has no needle valves to get out of order. The pump unit is equipped with automotive type piston and piston rings, which guarantee maximum pressure at all times. Hardened and ground automotive type poppet valves, operating on hardened and ground valve seats, insure trouble-free operation.



At left: The "Load King" Truck

Above: Cut-away view of head

The large-diameter lift ram is solid steel, precision-ground and polished. Operating in a cylinder equipped with Chevron leather seals encased in bronze bushings, it assures maintenance of oil pressure to support loads in elevated position.

The five-pint oil reservoir, approximately five years' supply, insures continuous truck operation. The pump unit is fully guarded and protected from outside shock and possible damage. The one-piece frame serves the double purpose of elevating platform and elevating frame. All parts consisting of frame, rear wheel assembly and front head assembly, are designed with a high factor of safety in all models.

Front head and wheel fork are heavy section steel castings, precision-machined for accurate fitting. Large Timkin thrust bearing on the steering column, provides easy steering of heaviest loads.

Front and rear lifting links are steel castings with broad bearing surface, equipped with hardened steel bushings and pins—connected by hard-carbon, heavy steel bars.

Rear wheel links and axle housing are a one-piece unit, adding strength and stability to truck construction.

Wheels on standard models are smooth machine-faced steel, and equipped with ball bearings, sealed to exclude dirt and other foreign matter.

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The balanced tubular handle, with comfortable, chrome-finished hand grip, and with tubular shaft and lower handle casting welded into a single unit, allows no parts to work loose; relieves operator of carrying handle weight; and prevents accidents from workmen tripping.

Load platform and lifting saddle are reinforced heavy plate and bar steel—arc-welded into a rigid unit structure, guaranteed to withstand continuous heavy-duty service.

* * *

Aids to Navigation

(Continued from page 80)

and boats of every size and description, and, furthermore, these furnish warning signals the use of which is not dependent on the operation of any instrument other than the human eye or ear. However, the use of radio aids is extending more rapidly every year and the relative importance of the high power sound and light signals which are unable to penetrate fog or are erratic in propagation characteristics has been considerably diminished by the current general use of the radio aids.

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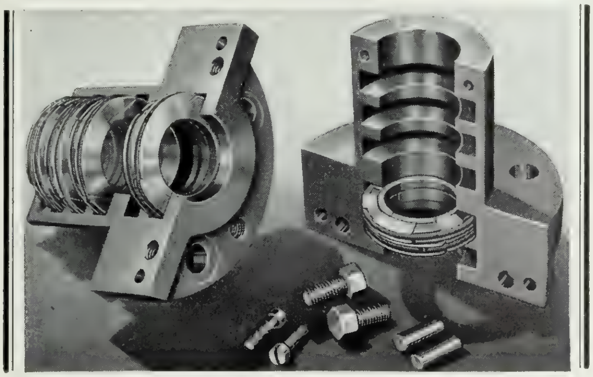

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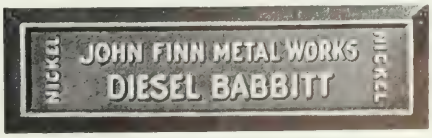

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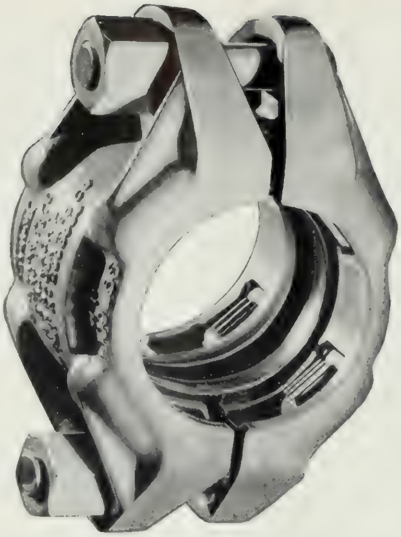
A Practical Pipe Connection

A practical time-saving development in pipe connections, Rolagrip pipe couplings, a modern and simple method for joining plain and beveled end pipe without any preparation of pipe ends, are manufactured by the Gustin-Bacon Manufacturing Company of Kansas City.

Rolagrip couplings have been used for years on pipe conveying air, oils, gasoline, gas, salt and fresh water. Many modern shipbuilders now use Rolagrips instead of flanges on bilge, peak tank, cargo, fuel oil transfer, drain and ballast lines. They cost less than flanges, are less expensive to apply, weigh less, and occupy less space. They also serve as an emergency repair device aboard ship. A damaged section can be cut or torched out, and a "Dutchman" quickly assembled in the pipe line with Rolagrips.

Bulkhead stress can be relieved if the piping is connected with these couplings, as axial movement of the piping is absorbed by the Rolagrip—each coupling in the line absorbing its share of the movement—thus preventing all the pipe movement being concentrated at one point.

Rolagrips are composed of a very few easily and quickly assembled parts—two housings, two bolts and an oil- and flame-resisting synthetic gasket. The housings, which contain ribbed, cadmium plated, case-hardened steel rollers, are made from corrosion-resisting, copper bearing malleable iron which conforms to A.S.T.M. Specification A-47-35, Grade 35018.



Rolagrip pipe coupling

The plain end pipe is firmly gripped by the ribbed rollers which imbed themselves in the pipe faces and recesses of the housings. The recesses within which the rollers operate are designed to give play to the normal forces of expansion and contraction, at the same time opposing separation of the pipe ends. In many cases the ability of these couplings to provide axial and radial deflection compensates for pipe movement, without the expense of installing tricky and expensive piping layouts.

Pipe connections can be quickly applied without previous pipe end preparations, eliminating the necessity of protecting such prepared pipe ends from damage. Rolagrips also eliminate prefabrication errors, because pipe lengths and bends can be cut on the job. In some cases, light wall, plain end pipe can be used to effect considerable savings in pipe costs and freight.

Engineers' Licenses for January

Name and Grade	Class	Condition
HONOLULU		
F. E. Pierson, 3d Asst.	SS, any GT	O
JUNEAU		
E. E. Robison, 3d Asst.	SS, any GT	O
SAN PEDRO		
F. Flanner, Chief	SS, any GT	RG
G. W. Huddleston, 2nd Asst.	SS, any GT	RG
SEATTLE		
N. Jonsen, Chief	MS, any GT	O
SAN FRANCISCO		
W. M. Tyler, Chief	SS, any GT	O
J. G. Ellis, Chief	SS, any GT	RG
R. W. Knight, Chief	SS, any GT	RG
J. F. Marshall, Chief	SS, any GT	RG
W. M. Putnam, Jr., Chief	SS, any GT	RG
G. W. Smithers, Chief	SS, any GT	RG
H. Cepeda, 1st Asst.	SS, any GT	O
M. J. Cunninghame, 1st Asst.	SS, any GT	RG
K. R. Madison, 1st Asst.	SS, any GT	RG
B. E. Mattox, 1st Asst.	SS, any GT	RG
L. Aller, 2nd Asst.	SS, any GT	RG
O. G. Larsson, 2nd Asst.	SS, any GT	O
O. A. Roy, 2nd Asst.	SS, any GT	O
M. G. Spencer, 2nd Asst.	SS, any GT	O
C. Beach, 3d Asst.	SS, any GT	O
K. M. Campbell, 3d Asst.	SS, any GT	O
E. B. Reading, 3d Asst.	SS, any GT	O
A. M. Kazi-Girey, Chief	MS, any GT	O

Abbreviations: SS is steamship; MS is motorship; GT is gross tonnage; O is original license; RG is raise of grade. All of these licenses are for ocean service.

* * *

Deck Officers' Licenses for January

Name and Grade	Class	Condition
HONOLULU		
C. McNulty, 2nd Mate	SS & MS, any GT	O
SAN PEDRO		
H. E. J. Shell, 2nd Mate	SS, any GT	RG
SEATTLE		
A. W. Howgate, Master	SS, any GT	RG
E. A. Folmar, Master	SS, any GT	RG
E. W. Hundley, Chief Mate	CWSS, any GT	RG
SAN FRANCISCO		
L. E. Bader, Master	SS & MS, any GT	RG
S. Howe, Master	SS & MS, any GT	RG
W. W. Wagener, Master	SS & MS, any GT	RG
C. B. Gjedsted, Chief Mate	SS, any GT	RG
H. E. Pasquale, Chief Mate	SS, any GT	RG
J. J. Sandbote, Jr., Chief Mate	SS, any GT	RG
J. J. Jensen, 2nd Mate	SS, any GT	O
K. A. I. Brunberg, 2nd Mate	SS, any GT	RG
W. H. Chilcoat III, 2nd Mate	SS, any GT	RG
R. H. Macomber, 2nd Mate	SS, any GT	RG
R. E. Devine, 3d Mate	SS, any GT	O
W. R. Long, 3d Mate	SS, any GT	O
T. L. Rich, 3d Mate	SS, any GT	O
C. R. Wolf, 3d Mate	SS, any GT	O

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HAPTER XLII ON AMERICAN COMMERCE

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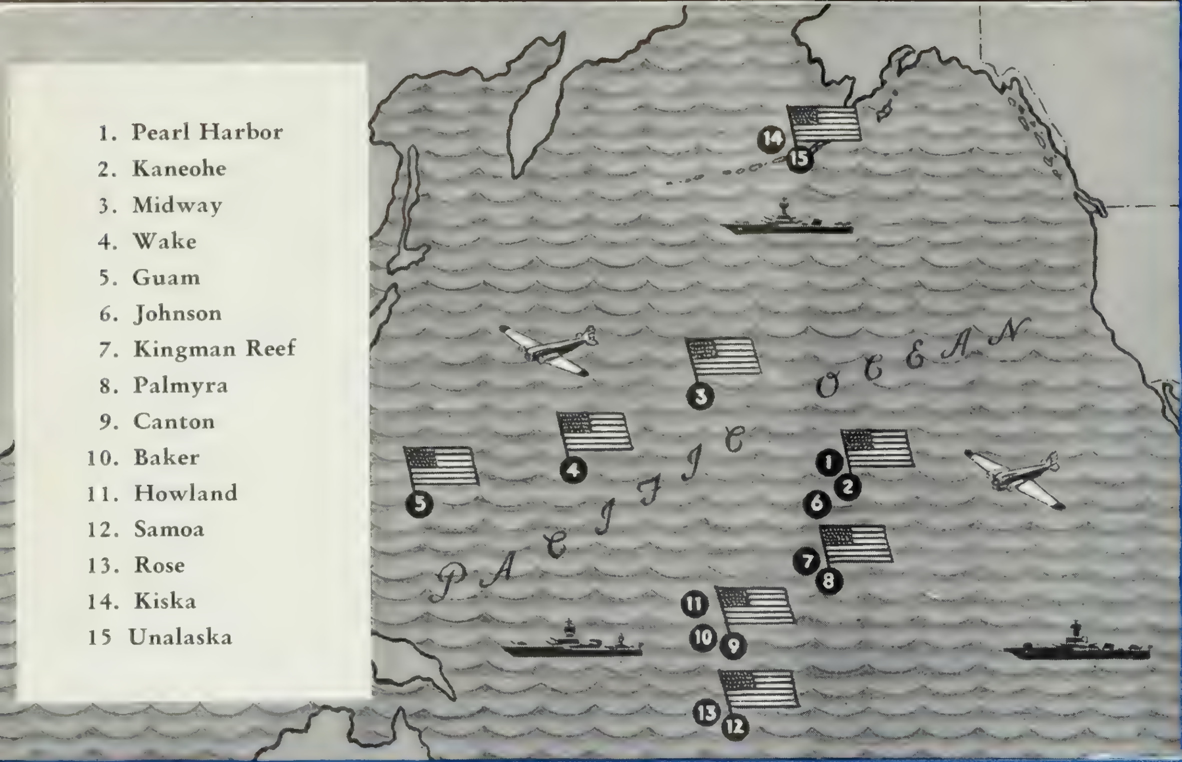

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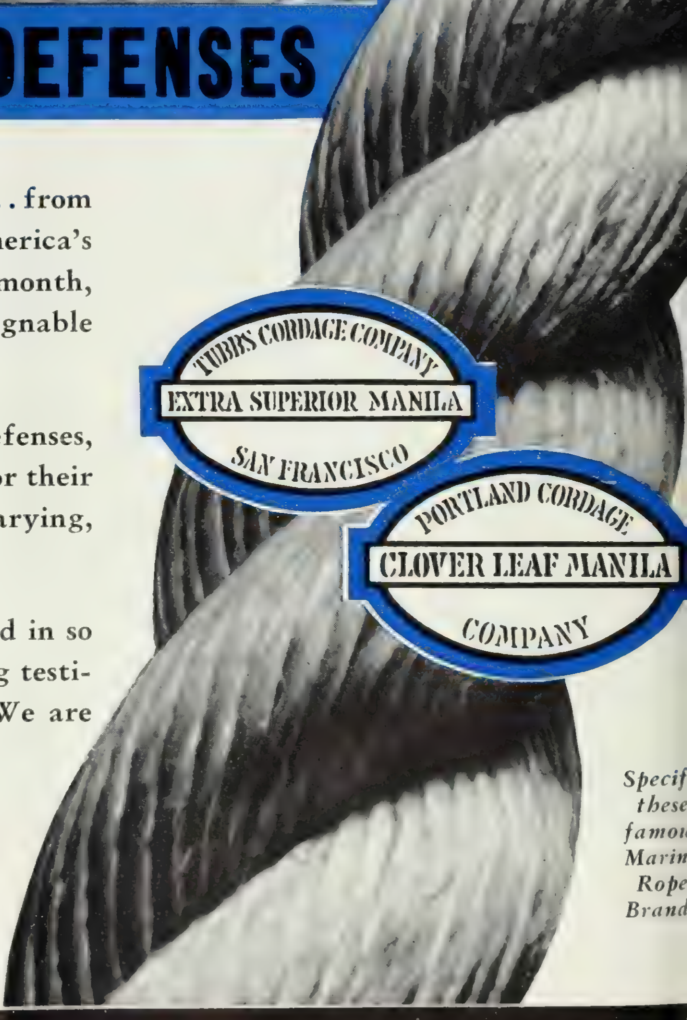

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Pacific MARINE REVIEW

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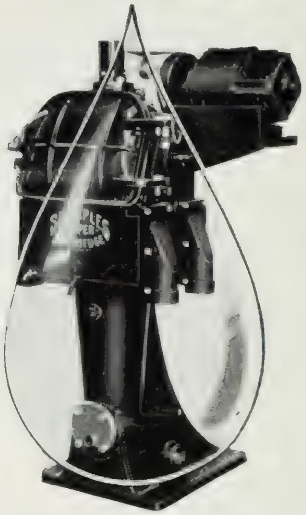

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Pacific
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Editorial Comment

A Pacific Coast Maritime Commissioner

At long last, on March 20, President Roosevelt has appointed a Pacific Coast resident, Captain Edward Macauley of San Francisco and Hillsborough, as a member of the Maritime Commission, to fill the vacancy created by the resignation of Commissioner Max O'Rell Truitt. The unexpired term of Mr. Truitt ends on September 26, 1944. The appointment was made effective April 1, 1941.

Edward Macauley is a graduate of the U. S. Naval Academy, Annapolis, with the class of 1896. His naval experience covered active sea service in all grades and on practically every type of ship. He was an ensign on U. S. Cruiser Brooklyn at the Battle of Santiago in the Spanish-American War, and he assisted in the organization of the Navy Intelligence Office in 1915, serving as its assistant director for two years.

Captain Macauley resigned from the Navy voluntarily in 1922 while serving at San Francisco as assistant to the Commandant, 12th Naval District. Shortly thereafter he established the firm of Hibbs, Macauley and Smith, naval architects, marine engineers and marine surveyors. The work of this firm covered: design and construction of several types of vessels; design and consultation on marine power plants, surveys of ship hulls, machinery and cargoes; estimation of costs; and supervision of construction.

Since retiring from this work Captain Macauley has devoted much of his time to public service and has held many appointments such as: Member of National Longshoremen's Board, 1934; California Federal Civil Works Administration, 1933-34; member of California Re-employment Commission, 1939; and member of California State Council of Defense, 1940-41.

Captain Macauley, on several occasions, was a valued contributor of articles to Pacific Marine Review.

Shipping leaders on the Pacific Coast are hailing his appointment of Captain Macauley as, in many ways, a peculiarly happy solution of Pacific Coast representation on the Maritime Commission. President Henry F. Grady, of the American President Lines, a lifelong student of Pacific Coast shipping, is frankly elated. Says he, "I know of no one in the entire country better qualified."

Commission Forms New Shipping Division

The United States Maritime Commission on February 28th announced creation of a Division of Emergency Shipping. This Division will handle all emergency transportation problems, will maintain liaison with the Navy Department, War Department, Reconstruction Finance Corporation, Office of Production Management, State Department and all other Government Departments and Agencies with respect to ocean transportation, and will have supervision over sales, charters, reallocations, reassignments and requisitions of all vessel tonnage in connection with emergency transportation.

Mr. H. Harris Robson was appointed Director of the Division and Mr. M. L. Wilcox was appointed Assistant Director of the Division.

The primary duty of the new Division of Emergency Shipping will be to make the most efficient possible use of available American flag tonnage.

Pacific

Some Comment on Current Developments

Control or Requisitioning

The Division of Emergency Shipping was recently formed by the U. S. Maritime Commission with the intent of speeding up the movement of strategic National Defense supplies from all available overseas areas. This body is at present acting through a policy committee of American ship operators headed by Frank J. Taylor, president of the American Merchant Marine Institute. H. Harris Robson, vice president of the United Fruit Company, and one of the keenest minds in the American ship operators group, has taken leave of absence from his private business and is heading the Division of Emergency Shipping.

Assignments for transportation of essential products are now handled by the Division directly to the ship operators through their policy committee.

E. J. Bradley, assistant freight traffic manager of Matson Navigation Company and a recognized authority on Marine traffic problems in the Pacific area, has been loaned to the Maritime Commission by Matson to act as Coast.

The marked increase in sinking of British bottoms, the passage of the Lend-Lease Bill, the constant barrage of press comment on delays in National Defense contracts and the legislation now pending, which, if passed, would give the Maritime Commission wide requisitioning powers, are all working on the mind of the American shipowner to cause a lot of unease and not a little lack of sleep.

There is some expectation that a lot of the American tonnage now operating from Atlantic ports through Panama to South Pacific ports will be diverted to Pacific Coast ports in the interest of quicker turn-around and less danger of interference.

The Emergency Division has asked the Intercoastal Steamship Freight Association to bring all the lines in that service together in order to plan some method for the shortening of turn-arounds and the contribution of some tonnage to the more vital overseas trades.

While no decision has been made at this writing, there is considerable speculation over the advisability of terminating intercoastal shipping for the duration and releasing all of that tonnage. The Emergency Division, however, at present, leans to the policy of maintaining intercoastal service, in a more efficient condition by effecting better economy of operation.

The survey caused by this issue gave the intercoastal operators a surprise. There are still 114 vessels in the service, which is only 12 or 14 less than a year ago and compares with the peacetime normal of 150 ships. These figures indicate that present lack of space in this route is due as much to increased traffic as to scarcity of vessels.

The Emergency Shipping Division is giving a great deal of attention to the matter of cargo priorities, both on

Shipbuilding Flash

The Secretary of the Navy announced, on March 21, the allocation of contracts for 239 smaller type navy auxiliaries with a total estimated cost of $100,315,682. These included: 180 wooden mine sweepers, in two types, with total cost of $49,343,214; 30 wooden sub chasers, $3,885,428; 10 steel fleet tugs, $13,562,372; 19 steel mine sweepers, $33,521,668.

Of this total order, Pacific Coast boat builders secured approximately $27,000,000.

The details of these contracts for the Pacific Northwest and for the Pacific Southwest appear on pages 51 and 54 respectively. The San Francisco Bay Area got $9,100,000, divided among five firms as follows: United Engineering Company, San Francisco, 4 fleet tugs, $5,500,000; Anderson and Christofani, San Francisco, 6 mine sweepers, $800,000; F. L. Fulon Company, Antioch, 6 mine sweepers, $800,000; Coleburg Boat Works & Stephens Brothers, Stockton, 6 large mine sweepers, $2,000,000.

Shipping Trends

export and import shipments. Cargoes to be given priority are certified to the Office of Production Management by the Emergency Shipping Committee.

By the time this article is in the hands of the reader, requisition and/or drastic Governmental control may be in full operation.

Captain Howard L. Vickery, Maritime Commissioner, speaking recently at the U. S. Coast Guard Academy at New London, Connecticut, stated that he regarded such control as a certainty. Outlining the forms that such control would take, he asserted that first would come "cargo priorities," then if priorities were not sufficient requisitioning would follow, with actual operation under private officials but directed and paid for by the Government.

Ship Charter Control

During the past month, charter rates on American cargo vessels have been soaring to new highs. Many of the terms are private but others that have been made public indicate that the rates for time charters and bare boat charters are approaching a record.

The U. S. Maritime Commission is making an effort to check this rise and also the rise of sale prices. On March 12 the Commission requested all American citizens or American corporations owning American flag or other merchant ships to submit to the Commission any proposed sales or charters of their vessels.

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*U. S. Maritime **Commissioner Capt. Howard L. Vickery, U. S. Navy,** as head of the technical division, has produced many fine vessels for the American Merchant Marine and is a keen observer of American shipping. When he says **strict control is coming soon,** you can be very sure it is right around the corner*

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In this connection, the reasons set forth are as follows:

This request is made in order to secure the maximum use of all vessels of United States registry and of other vessels owned or controlled by citizens of the United States for the purpose of transporting National Defense and strategic materials.

If the Commission is advised of proposed sales and charters, it will be possible to obtain the most efficient use of ships. This cooperation will also assist in preventing unreasonable increases in freight rates which would result from high sales prices or charter rates. This is a step in the prevention of price inflation based upon unreasonable freight rates.

The procedure will assist in maintaining American ships on routes where they will be of greatest value for the carriage of defense materials outbound and strategic materials inbound.

For the same reasons, ship owners are also asked to confer with the Commission prior to diverting vessels from their normal pre-war routes into other services, or to transferring vessels to services in which they were not normally employed prior to the war.

The arrangements cover vessels of United States and foreign registries, owned by United States citizens directly or through subsidiaries or affiliates.

Almost immediately, the Division of Emergency Shipping began to safeguard against diversion of tonnage. Its first action was to disapprove time charters of the S. S. Susan Luckenbach to the Chilean Nitrate Sales Corp., and of the S. S. Executive to Amtorg Trad-

Lumber for the Orient—for Eastern America—for Western Europe is one of the main foundations of American shipping on the Pacific. It has begun to move again in huge quantities. The big log rafts are moving again on Puget Sound

ing Corp. Both these charters were disapproved because the "ships were needed for transportation of materials necessary for the National Defense Program of the United States."

Auxiliary Coast Guard

A nation-wide voluntary organization, known as the Auxiliary Coast Guard and to be composed of owners of motorboats or yachts, has been formed and divided into 16 districts, one of which has headquarters in San Francisco. Any citizen over 15 and owning not less than 25 per cent interest in any yacht or motor boat is eligible. Candidates for membership must give satisfactory evidence of a "thorough knowledge" of (1) handling and operation of vessels; (2) rules of the road; (3) buoyage system in the United States; (4) navigation laws applicable to the vessel upon which his application for membership is based; (5) regulations of the U. S. Goast Guard Auxiliary.

This organization is formed for the purpose of (1) furthering interest in safety of life at sea and upon navigable waters; (2) promoting efficiency in the operation of motorboats and yachts; (3) fostering a wider knowledge of, and better compliance with, the laws, rules and regulations governing the operation of motorboats and yachts, and (4) facilitating operations of the Coast Guard.

This organization should be of great help to the overworked, undermanned Coast Guard.

Roger Lapham on Mediation Board

Roger Lapham

Roger Lapham has become, by common acclaim, the dean of Pacific Coast shipping men. As chairman of the board of the American - Hawaiian Steamship Company, he is heading a smoothly-functioning, well-oiled organization that was built up largely under his own direction and is acknowledged to be outstanding among American seagoing corporations.

Because of his own lifetime experience in this organization and of the confidence and skill of his assistants in the management thereof, Mr. Lapham is now enjoying more leisure which he can and does devote to public service. Much of his time in recent years has been given to earnest, intelligent study of labor problems and the setting up of machinery for their solution.

Out of this effort grew the San Francisco Employers Council with its remarkable record of peaceful settlements of disputes between organized labor and employers.

It was therefore quite natural that President Roosevelt, in choosing eleven men for the newly created National Defense Mediation Board, should select Roger D. Lapham as one of the four members of that board who represent the employers of the nation and that Mr. Lapham should answer, "Glad to serve."

Roger D. Lapham is an honest, forthright, sincere American citizen. He never pulls his punches in fighting for the American way of life and he is always pulling his share of the load in any effort to make things right.

His family roots, on both sides, run back into old New England Colonial days. Many of his ancestors were shipmasters, ship operators and shipowners in the clipper ship era and in the earlier days of the trading ships.

Shipping is in his blood and the problems of the American Merchant Marine are his own problems—his life time study.

No better choice could have been made. The Pacific Coast is glad to be represented on this important Federal board and doubly glad that Roger D. Lapham is its representative.

Pending Shipping Legislation

The U. S. Maritime Commission is seeking legislative authority for possible emergency measures, rather than depend on executive order. H.R. 3252, introduced by Representative O. S. Bland, chairman Merchant Marine Committee of the House, would, if passed, permit the Commission to charter all American flag vessels for the duration of the emergency and at rates set by itself. The bill would also authorize allocation of vessels to trade routes without advertising for competitive bidding on charters. In addition it would give the Commission authority to allocate shipbuilding assignments without competitive bidding; and to negotiate with owners for purchase or charter of alien ships tied up in American ports.

Meanwhile, the Commerce and Navigation Committee of the Assembly of the State of California has up for consideration four bills which are so vicious that interested citizens have formed themselves into a group known as the Committee Opposed to Assembly Bills Nos. 17, 537, 1002 and 1056.

This committee is headed by **D. W. Dickie,** San Francisco naval architect, and has for its acting secretary, **M. A. Cremer,** manager of the San Francisco Marine Exchange.

Other members include J. G. Rapp, boat and motor distributor; H. D. Birch, Small Boat Racing Association; W. H. Bostwick, Associated Sportsmen of California; J. DeWitt, Yacht Racing Association; E. J. Dollard, Northern California Power Cruiser Association; F. H. Evers, surveyor; H. Freed, ship chandler; H. W. Glensor, Pacific Inter-Club Yacht Association; William Henderson, yacht broker, and R. J. Lutich, marine underwriter.

Bill 17 provides for the registration and regulation of marine surveyors. Bill 537, among other things, would impose a license fee upon sport and pleasure boats in an amount equal to three per cent of the actual market value of such boats. Bills 1002 and 1056 seek to regulate, license and supervise yacht and ship brokers, salesmen, owners and other persons engaged in business activities incident to the ownership and operation of yachts and ships.

The committee maintains that if they are enacted into law these measures will work undue and unnecessary hardships upon maritime and business interests; increase governmental red tape; substantially raise the cost of transacting business, and burden commercial enterprise with additional taxation to support political jobs and bureaucracy.

Other Bills

Among other bills pending at Washington are the following:

S. 107—McKeller—Authorizing the President to enter into negotiations with Nicaragua and other Central American countries for, and providing for the construction, maintenance, and operation of an interoceanic canal over Nicaraguan territory.

S. 171—Gillette—Prohibiting producers, refiners, and marketers of petroleum products from being directly or indirectly engaged in the transportation of petroleum products, such as operation of oil tankers and barges on navigable streams, in coastwise trade or international commerce.

S. 210—Reed and Wheeler—For the regulation of freight forwarders by the Interstate Commerce Commission.

S. 264—Wiley—Authorizes Export-Import Bank to insure any business enterprise carrying on an export business against losses such business may sustain by reason of being unable to obtain payment for shipments to consignees in foreign countries.

H.R. 74—Dimond—Authorizes the Secretary of Commerce to prepare plans and specifications for the construction of a vessel for use in research work on fisheries of the Pacific Ocean, Bering Sea, and the waters of Alaska and Hawaii, and authorizing the appropriation of $500,000 for the construction.

The sleek "Round-the-World" greyhounds of the American President Lines are making passenger transportation history. Here is President Jackson at Havana

H.R. 167—Welch—Authorizes the Maritime Commission to pay an operating subsidy to vessels engaged in the intercoastal commerce of the United States by way of the Panama Canal.

H.R. 169—Welch—Provides amendment of Panama Canal Act, so that no tolls shall be levied upon American passenger vessels engaged in intercoastal service, that have accommodations for at least two hundred passengers, and are capable of a speed of at least sixteen and five-tenths knots.

H.R. 532—Bland—Authorizes the Maritime Commission to construct, equip, and furnish suitable vessels, one to each of the States of New York, Massachusetts, Pennsylvania and California, for the benefit of their respective nautical schools.

H.R. 554—Bland—Exempts sailing vessels from the provisions of section 13 of the Act of March 4, 1915, as amended, requiring the manning of certain merchant vessels by able seamen.

H.R. 556—Bland—Makes effective Minimum Age provision of the 1936 Revised Sea Convention under which no minor under sixteen years of age can be employed for any purpose on a ship.

H.R. 557—Bland—Makes effective and implements provisions of the Shipowners' Liability Convention, 1936, in respect to sick and injured seamen.

H.R. 558—Bland—Provides citizenship requirements for the manning of vessels, both subsidized and nonsubsidized.

H.R. 559—Bland—Amends section 4311, Revised Statutes of the United States, in respect to registry, enrollment, and licensing of vessels, including ownership.

H.R. 955 — Angell — Amends the Merchant Marine Act, 1936, as amended, to provide extension of aid to producers of lumber and manufactured timber products through transportation and landing of their products in foreign ports.

H.R. 1401—Harrington—Prohibits producers, refiners and marketers of petroleum products from operating tankers and barges. The same as S. 171 introduced by Senator Gillette.

H.R. 1585—Boykin—Providing for the amendment of Section 511 of the Merchant Marine Act, 1936, as amended, so as to extend to owners of American flag ships, who do not receive any subsidy from the Government, the same tax exemption on funds set aside for replacement and construction purposes, as is now granted to owners of vessels that do receive subsidies.

H.R. 1616—Oliver—Amending section 509 of the Merchant Marine Act, 1936, as amended, so as to allow the Maritime Commission to aid financially in the construction of vessels to be engaged in fisheries, and to pay for any National Defense features incorporated in the vessel, but not to include any construction—differential subsidy.

H.J. Res. 43—O'Leary—Providing for the registration of American-owned vessels under foreign registry during the continuance of the present state of war in Europe; and further providing that in selling vessels for operation in the combat area, the Maritime Commission should give preference to citizens of the United States who were formerly engaged in trade in these areas.

Coastwise Seagoing Telephone Service

In the annual report of the American Telephone and Telegraph Company for 1940, we find the following interesting paragraph:

Telephone service by radio to coastal and harbor vessels continued to increase. New Bell System radiotelephone stations for this service were opened during the year at Wilmington, Delaware; Charleston, South Carolina; Tampa, Florida, and Galveston, Texas; and a second radiotelephone channel was added to the New York station to care for the growth in traffic. Also, construction was started on radiotelephone stations of this type at Portland and Astoria, Oregon. At the end of the year, 22 shore stations—15 of them Bell System stations—connected ships and smaller vessels to the telephone network on land. Several hundred vessels were newly equipped

A Graph of the American Fleet

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This interesting graph compiled by the American Bureau of Shipping shows the number by types of service, types of motive power and average age of all vessels in the American Merchant fleet of 2000 gross tons or over. The short black line in each case is diesel propelled ships, the long black line is steam propelled and the dotted line shows number in each class on the Great Lakes

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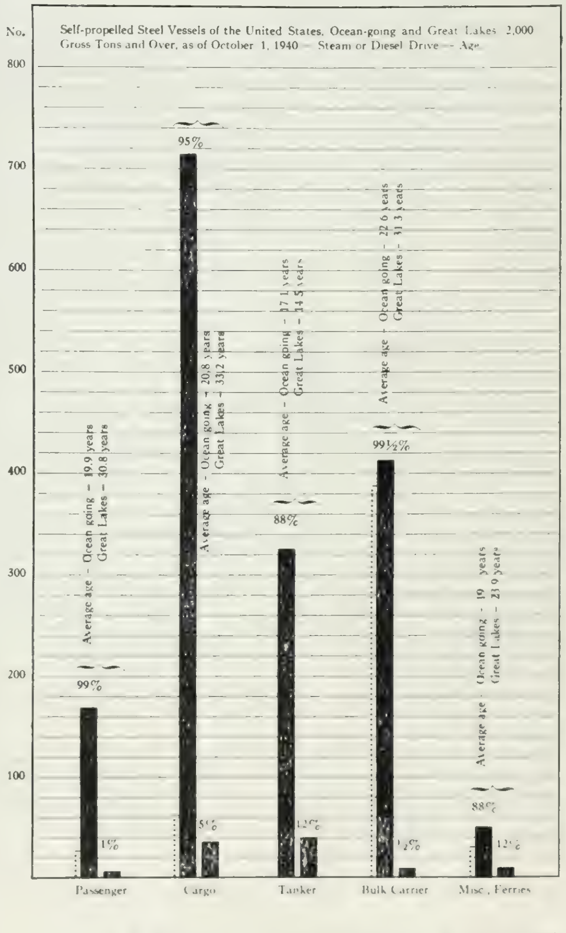


for this service, bringing the total at the end of 1940 to more than 2,500.

Remember the old wheeze of 20 years back. Question: "Can you telephone from a ship at sea?" Answer: "Sure! Any landlubber can tell a phone from a ship, at sea or any other place."

Presidents Come Ashore Generals Go to Sea

The former President passenger liners, President Jefferson and President McKinley, are now converted to troop transports and have been rechristened in honor of two U. S. Army generals.

President McKinley has now become J. Franklin Bell and President Jefferson is Henry T. Allen.

General Bell will be remembered as having a distinguished part in the Philippine Campaign, as Provost Marshal of Manila from 1899 to 1901 and as Chief of the General Staff, 1906-10.

General Allen was commander of the American forces in Germany from 1919 to 1923 during the so-called "watch on the Rhine."

Shipping Briefs

As of March 11, fifty-three steam schooners were in operation on the Pacific Coast. Forty-six of these are being operated coastwise and seven in the off-shore trades, according to a statement issued by the Shipowners Association of the Pacific Coast.

* * *

Scarcity of skilled citizen seamen due to draft, switch to shipyard work and growth of merchant marine is becoming a matter of concern to ship operators. It is roughly estimated that replacements for ratings of A. B. seamen, cook and radio operator will require from 10,000 to 12,000 men. U. S. Bureau of Marine Inspection and Navigation has been studying this problem for some weeks.

* * *

The S. S. California State, Maritime schoolship, with 130 cadets and 15 officers aboard, sailed from Balboa homeward bound on Saturday, March 15, and is due home at San Francisco about May 1, after several visits to ports en route.

* * *

John Paul Jones, secretary of the San Francisco Apostleship of the Sea, passed away on March 12. Jones was a leader in this fine seamen's welfare group since its founding and was a much loved figure among sailormen.

* * *

On March 14, **Governor Olson** of California appointed **Will Rogers, Jr.,** of Beverly Hills to the Board of Governors of the California Military Academy, replacing **Robert Abernathy** of Oakland, resigned. Rogers will serve until January 15, 1944.

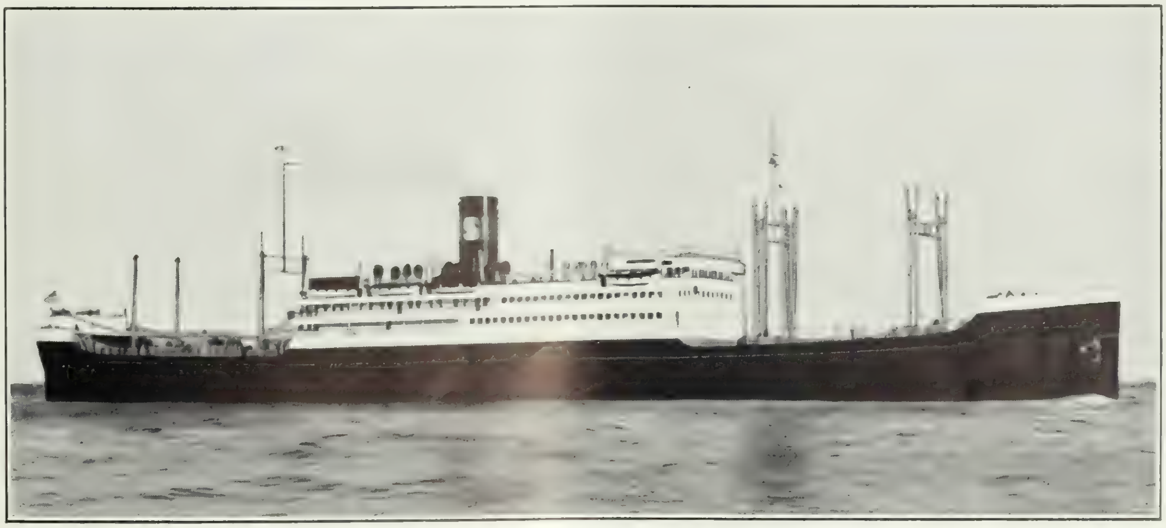
* * *

The Federal Government has taken over from American owners, ships aggregating over 400,000 gross tons, of which 270,000 tons are represented in passenger vessels with a total one-loading capacity of 75,000 men.

Among these passenger liners are the George Washington, 23,787 tons; the President Jefferson, 14,174; the President McKinley, 14,177; the President Grant, 14,119; the President Jackson, 14,123; the President Roosevelt, 13,869; Pan America, 13,712; Western World, 13,712; American Legion, 13,736; Southern Cross, 13,789; the Cities of San Francisco, Baltimore, Norfolk, Newport News and Los Angeles, each of 8,378 tons; the Santa Barbara and Santa Marina, 7,712 each; Santa Rita and Santa Inez, 4,576 each; Exochorda, 9,359; Orizaba, 6,737; Dixie, 8,188; Iroquois, 5,210; Irwin, 4,900 and the Kent, 4,858.

* * *

In Shanghai, March 15, the Canadian Pacific Steamship Lines announced cancellation of all reservations and all future bookings due to uncertainty of sailings. This leaves only two regularly scheduled passenger services from the Pacific Coast to the Orient. These are N. Y. K. and American President Lines.



Former "Round-the-World" liners as they are replaced by the new President ships, are being taken over by the government for transports

J. E. Schmeltzer

Ugly Duckling Becomes

First Contract Let for Emergency Type Ship

The President's emergency program called for a fleet of 200 simplified cargo-carrying ships that could be built quickly at low cost in yards especially prepared for this work.

As visualized by the President and Admiral Land, chairman of the U. S. Maritime Commission, the type of ship would be rather boxy in appearance, somewhat after the lines of the Hog Island type. Said the President, "These ships are what I call ugly ducklings."

A special department of the Commission was organized to handle the design and construction of these ships and J. E. Schmeltzer was placed in charge. He and the boys under him got busy, and presently there emerged from off the drawing board a design that apparently has very little resemblance to an ugly duckling. In fact, it begins to appear as if that homely fledgling, as in the old fable, has grown up to be a Beautiful Black Swan.

The original idea was for a deadweight-capacity of 7600. This has now been upped to 10,000 tons.

We understand that these vessels will be powered with reciprocating steam engines and will have simple steam-driven auxiliaries and deck machinery. The power, necessary to produce the 10-knot speed proposed, will be around 2500 shp.

It is typical of the care being taken by the Maritime Commission to preserve commercial values, that these ships are being built in new fabricating and erecting yards under a completely separate technical organization and with an entirely different type of contract. These vessels will probably go into British operation or at any rate to operation for purely National Defense purposes.

The new yards may, and probably will, be closed without loss as soon as the emergency is over; and the ships sold for foreign or for coastwise purposes, so as not to compete with subsidized faster types.

Following is a release by the U. S. Maritime Commission on the first contract for these vessels:

The first of seven contracts for the construction of 200 merchant ships of simplified design in the President's emergency program, has been cleared with the Office of Production Management and awarded to the North Carolina Shipbuilding Company, of Wilmington, North Carolina, the Maritime Commission announced recently.

The contract is for twenty-five ships at a total estimated base cost of $37,500,000. Delivery of the first vessel is called for within 287 days and all twenty-five vessels are to be delivered within 731 days from the date of the contract, which was signed Friday, March 14.

Preliminary work on construction of the vessels has been carried forward by the North Carolina Shipbuilding Company and the Commission for the last two months without waiting for the signing of the contract. The company has begun construction of a six-way shipyard at a cost of $5,140,000. Ground was broken for the yard on February 3 and tools and equipment have already been purchased.

Contracts for the other 175 ships being built in the emergency program are now being negotiated and are expected to be signed in the near future. Preliminary work on the construction of these ships has also gone forward, and new shipbuilding facilities necessary for the vessels begun. Many of the subcontracts have already been negotiated.

Rapid progress in construction of the emergency ships has been assured by the association of established shipbuilding organizations with each of the seven new yards. The North Carolina Shipbuilding Company is an affiliate of the Newport News Shipbuilding and Dry Dock Company, Newport News, Virginia. The Bethlehem - Fairfield Shipyard, Inc., which is scheduled to build fifty of the vessels, is affiliated with the Bethlehem Steel Corporation. The Oregon Shipbuilding Company, California Shipbuilding Company and Houston Shipbuilding Company, which are scheduled to build 31, 31 and 25 ships, respectively, are affiliated with Todd Dry Dock Corporation and Six Companies, Inc. The yard at Mobile,

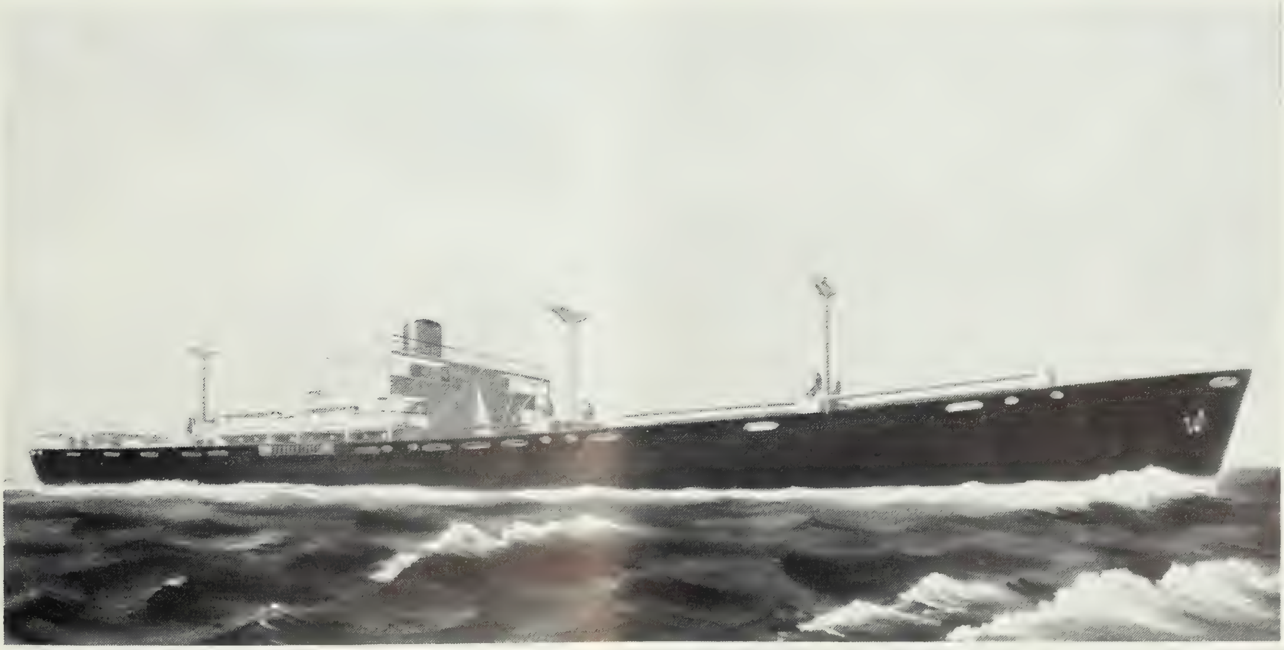
Beautiful Black Swan

Alabama, will be an extension of the existing yard of the Alabama Dry Dock & Shipbuilding Company, which is expected to build thirteen ships. The American Shipbuilding Company of Cleveland, Ohio, with extensive ship construction experience, on the Great Lakes, will be responsible for the ship construction of an estimated 25 vessels to be built at the New Orleans yard of the Louisiana Shipbuilding Company, Inc.

The contract with North Carolina Shipbuilding Company includes an unusual provision for encouraging early deliveries at low costs. The contract is on the basis of cost plus a fixed fee with penalty and bonus. The penalty is applied if the contractor exceeds the estimated time of delivery and if his construction costs are higher than estimated. The bonus is applied for anticipated delivery schedules and for reducing costs below those estimated. On the basis of a fixed fee per vessel of $110,000, the penalty can reduce the fee to the contractor to a minimum of $60,000, and the bonus for speedy delivery and reduced costs can increase the fee to a maximum of $140,000. The base fixed fee profit to the contractor would amount to $2,750,000. Imposition of the penalty could reduce this fee by $1,250,000 or application of the bonus could increase it by $750,000.

The Commission was authorized to construct the 200 emergency ships in a joint resolution which became law on February 6.

The vessels will be 425 feet long, of 10,000 tons deadweight, and will have a speed of 10 to 11 knots.



The emergency type characterized by President Roosevelt as the "Ugly Duckling" has under the skillful designers of the U. S. M. C. grown into this beautiful black Swan. (Artist's sketch made from outboard profile)

An A-C Success

Diesel Electric Tuna Clipper With Many New Features

by J. C. Fink, Marine Engineer
Westinghouse Electric & Manufacturing Company
East Pittsburgh, Pennsylvania

Incorporating new ideas in hull construction, an improved refrigeration and storage arrangement, and a diesel-electric alternating-current propulsion system, the new tuna clipper Challenger sets a unique style of design for this type boat. The design of the power equipment on the new clipper represents a departure from usual "tried" designs. Operating results differ too; on one of her recent trips, Challenger made a record one-day porpoise fishing catch of 50 tons. Her record low fish spoilage loss, less than one per cent of her catch, compares favorably to common loss averages for existing tuna boats.

The name of the new boat is truly symbolic of her purpose; she is a challenge to conventional tuna clipper design, the first American diesel ship to utilize this form of alternating current propulsion, and thought by many to be the first ship of her kind.

The propulsion system used was conceived by James N. Johnson, manager of the San Diego Marine Construction Co., who set out to prove his convictions by persuading Capt. Oakley J. Hall, president of the shipyard, that this unique vessel should be constructed on their own account. Challenger was completed last July, and has since made several very successful fishing trips to the Galopagos Islands. Operating reports indicate that she has exceeded all expectations, and prove without a doubt that her new features have many advantages over conventional designs for this service.

Hull Design

Challenger has a raised forward deck and a cruiser stern. She is 128 feet long, having a 27-foot 1-inch beam and a depth of 13 feet 3 inches. Hull construction is of the composite built type, introducing for the first time in tuna clipper designs, a combination steel and wood hull structure. The keel is of Oregon fir 108 feet long having a rectangular section 14 inches by 16 inches. Bolted to this heavy keel is a 5/16-inch steel keel plate to which are welded steel angle frames on 19-inch centers carrying steel deck beams and 3½-inch Bataan mahogany planking. The use of steel frames accomplished a substantial saving in space, and the particular arrangement of the composite structure provided rigidity ordinarily obtained in wood hulls only by means of bulky timbers. The space normally occupied by massive timber members is now used for a deep tank bunkering part of the diesel fuel. Additional fuel storage tanks are located in the forward and stern ends of the hull.

Power Plant

The power plant, serving the requirements of both the propulsion system and all auxiliary loads, consists of three Atlas Imperial diesel engines each driving an alternating current generator. Two of the engines are of the 8-cylinder type rated 275 hp at 514 rpm driving 175-kw, 440-volt, 14-pole, 3-phase, 60-cycle, 80% power factor a-c generators, while the third engine is a 6-cylinder unit rated 200 hp at 514 rpm driving a 125-kw, 440-volt, 14-pole, 3-phase, 60-cycle, 80% power factor a-c generator. For excitation purposes, each generator has an attached, belt-driven, direct-current exciter controlled by automatic voltage regulators maintaining constant voltage on the power system. The diesel engines run at constant speed, providing a constant frequency a-c system.

Since a constant voltage and frequency power supply is required for the auxiliary load, which in this case is relatively high in comparison to the propulsion load, special consideration was given to the design of a marine type propulsion motor and gear assembly which would provide economically a wide range of speed in both the ahead and astern directions. This propulsion motor and gear assembly is quite novel, in that it consists of three wound-rotor induction motors arranged in tandem with a reduction gear unit which in turn is coupled to the propeller drive shaft.

Starting at the forward end, the motor assembly consists of a 60-hp, 500-rpm (14-pole) motor, aft of which is a 250-hp 880-rpm (8-pole) motor, and next to the gear unit is a 500-hp, 1175-rpm (6-pole) motor. All motors are coupled together and to the reduction gear unit, resulting in a 4-unit tandem drive assembly.

The reduction gear is a single-reduction, vertically-offset marine type designed to transmit the power of the high-speed tandem motors to the low-speed propeller shaft. It employs the use of a double helical cut pinion and main gear having a ratio of 5.8 to 1. The gearing is enclosed in a welded, fabricated, steel housing having a built-in thrust bearing which takes the thrust from the low-speed shaft. The lower section of the gear housing contains an oil reservoir from which oil is taken through a lubricating system consisting of an attached pump, strainer, cooler and necessary fittings to distribute the oil to the gears and bearings. This gear unit transmits the power to the propeller shaft with a loss at full load of approximately 1.5 per cent.

Power Distribution and Control

The power from the diesel generating sets is distributed to the propulsion and auxiliary circuits through a modern marine type, dead front, steel panel, enclosed distribution switchboard. This switchboard provides for generator control, propulsion and auxiliary power distribution, lighting auxiliary motor starters and miscellaneous circuits.

With this switchboard, all three generators can be operated in parallel, or any combination of the three units can be paralleled as required to meet the power demands of the propulsion and auxiliary systems.

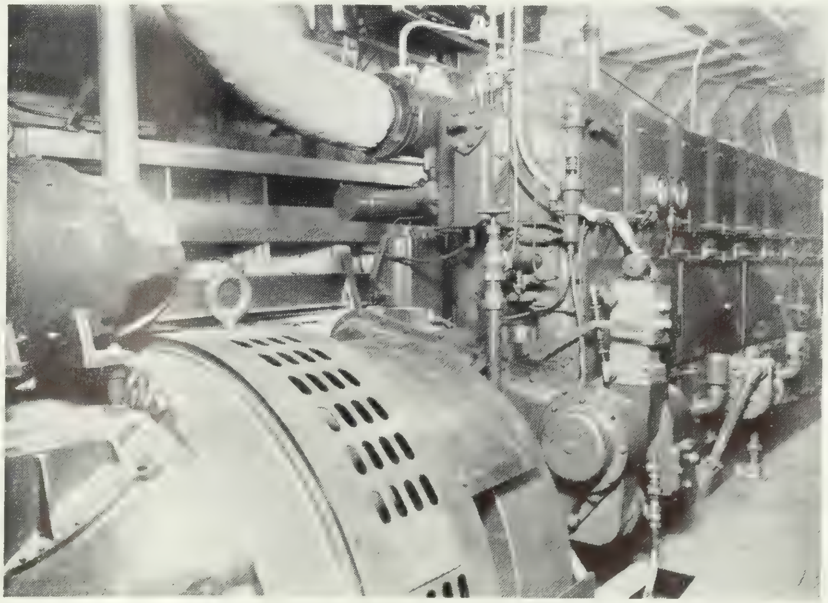
The generator portion includes such instruments as main circuit ammeters, voltmeters, field circuit ammeters, wattmeters and frequency meters for the three generators. Engine governor control switches are also provided on this panel, allowing the adjustment of engine speed as required for synchronizing and division of load.

The generating sets may be synchronized either automatically or manually. Automatic synchronizing is accomplished by a relay which measures the "beat" frequency between two generators to be paralleled. The relay functions automatically when the "beat" frequency is sufficiently low, indicating that the voltages of the units to be paralleled are approximately equal and in phase. This relay then initiates the action of electrically-operated contactors, closing the circuit between the generators, thus paralleling them on the 440-volt bus. Manual synchronizing is also provided by means of volt-meters, lamps and pushbutton control of the electrically-operated contactors. In addition to the electrically-operated contactors, the generating sets may also be placed on the main bus by means of knife switches operated from the front of the dead front switchboard.

Automatic Silverstat voltage regulators connected in the exciter field circuits function to maintain constant generator voltage on the system over a wide range in load. In addition, these regulators divide the reactive kva proportionately between the generating units paralleled on the main bus. This voltage regulator, with its simplicity, freedom from vibrating parts, compactness and corrosive-resisting finishes, is particularly well adapted for marine service. Generator and exciter field rheostats permit manual adjustment of generator voltage when desired.

This control desk in the pilot house enables the navigator to assume complete control of the power plant

The power distribution portion of the switchboard consists of a compact arrangement of "De-Ion" circuit breakers; it includes a 600-ampere propulsion feeder breaker, and 16 breakers rated from 15 to 90 amperes for auxiliary feeder circuits.



One of the Atlas Imperial 275 P Diesel engines and its 175-kw Westinghouse generator

A grouped arrangement of twenty manual and magnetic starters for the control of auxiliary motors is assembled on the aft end of the board. Ten manual starters are for auxiliary motors under 10 hp, and ten line starters control motors rated 10 hp and above. Each linestarter includes its own start-stop pushbutton operated from the front of the switchboard. This grouped arrangement centralizes the control of all auxiliary motors and places them in easy reach of the operating engineer, who can determine at a glance which auxiliaries are in use, and can increase or decrease the generating capacity as required.

Lighting distribution equipment at the aft end switchboard consists of a panelboard providing 18 singlepole breakers arranged for a 115-volt, 2-wire ungrounded neutral system. This panel also supplies 115-volt power to small auxiliaries, such as radio, or water system. Power for the 115-volt lighting and auxiliary circuits is taken from a 10 kva, 440/115-volt dry-type transformer. When the vessel is docked for long periods, the lighting load can be transferred to a shore power supply.

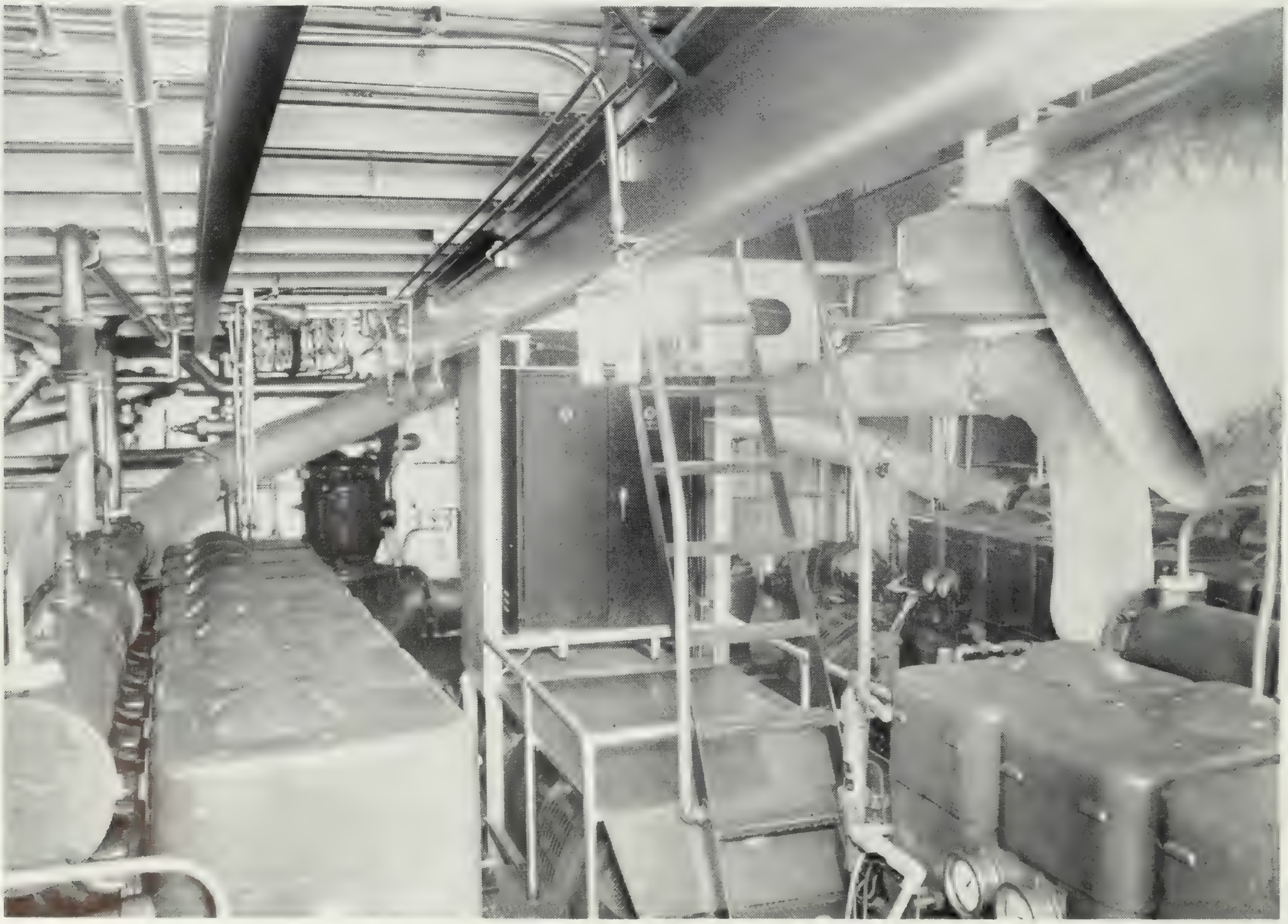
An important safety feature of this distribution switchboard is the manner in which all 440-volt circuits are enclosed to protect the operating personnel.

Pilot House Control

Full control for the propulsion system is normally handled directly from the pilot house control desk. Mounted in this desk is a master speed controller for remote operation of the main circuits handled by the propulsion control located in the engine room. This gives the pilot house complete control of the ship, and with the wide speed range available, together with the flexibility and maneuverability of the drive, it is possible to follow schools of tuna with great accuracy.

In the engine room the propulsion control equipment, enclosed in a sheet steel cubicle to protect the operator personnel from the 440-volt circuits, houses a motor-operated controller with main switch units connected in the primary and secondary circuits of the three induction type propulsion motors, and auxiliary switches used for remote follow-up control in conjunction with the pilot house master controller.

The motor-operated controller functions to start, stop, reverse and regulate the speed of the propulsion motors. Twelve operating positions provide twelve definite speed points in both the ahead and astern directions. While this controller is normally remotely operated from the pilot house, manual control is also available from the engine room by means of a handwheel on the front of the control cubicle.



Engine room of Challenger, featuring three diesel electric generating sets and below the ladder the forward end of the line of three propulsion motors

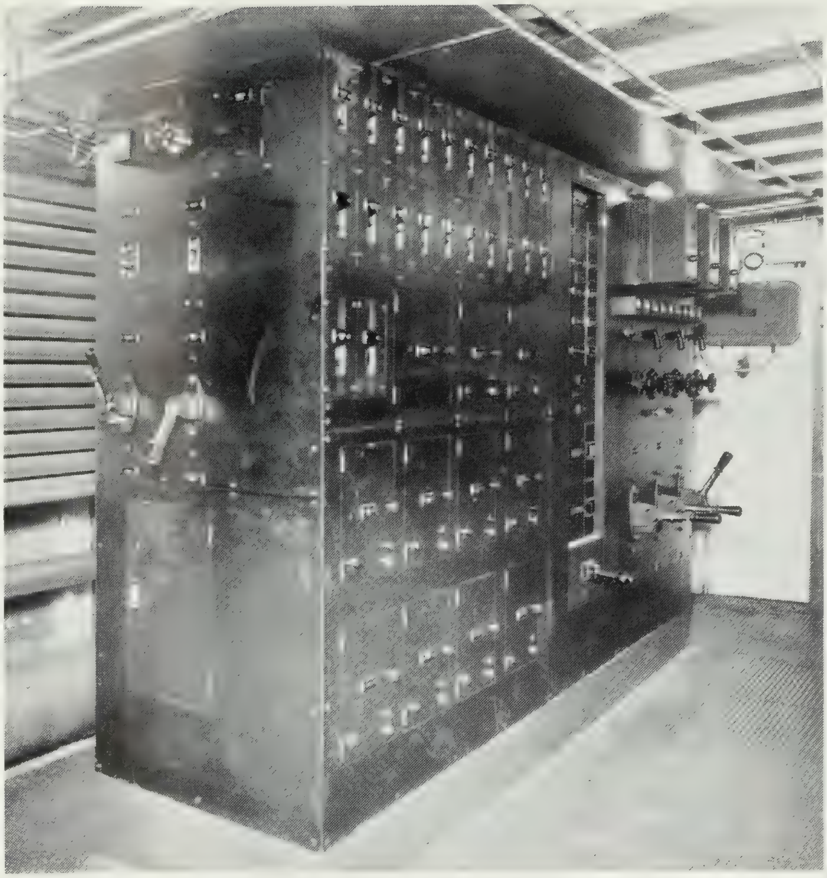
Maneuvering

The control of the three tandem motors is so arranged that in going from "stop" to "full speed" position the 60-hp motor is first energized with maximum secondary resistance providing the lowest speed point. In succeeding steps, the secondary resistance is reduced until the fourth position is reached, where the secondary circuit of this motor is short-circuited, providing maximum speed on this motor. On position No. 5 the 60-hp motor is de-energized and the 250-hp motor is now energized with maximum secondary resistance. Succeeding steps reduce its secondary resistance until the eighth position is reached, where the secondary circuit of this motor is short-circuited, providing maximum speed. Similarly on No. 9 position, the 250-hp motor is de-energized and the 500-hp motor is now energized; succeeding steps bring it up to speed in the same manner as the first two motors, so that on position No. 12 it has reached its maximum speed. Thus in this system only one of the three tandem motors is energized at a time. While the control provides three maximum efficiency speed points, each at maximum speed on the three motors, continuous operation is also possible on any of nine reduced speed points in either the ahead or astern direction.

Reversing is accomplished by interchanging two of the three phases in the common supply to the primary circuits of the three motors. This is performed automatically by the motor-operated controller when operated in the first astern position. Operation in astern in succeeding control positions is exactly the same as for ahead operation.

The motor-operated controller provides the necessary timing between speed steps so that uniform acceleration and deceleration of the propeller is maintained regardless of the speed at which the pilot house master control is operated. A complete follow-up control system between the pilot house controller and the motor-operated controller in the engine room assures positive duplication of control.

The secondary resistors for the reduced speed operation of the motors are mounted in a separate compartment located in the rear of the main control cubicle. They consist of nichrome ribbon edgewound on ceramic material. A blower for ventilating the resistors is mounted directly below the resistor assembly in the bottom of the cubicle.



Main distribution switch board on Challenger

A separate drip-proof cabinet, mounted under the control cubicle, contains the line contactor, overload relays and miscellaneous control relays for the three motors. This cabinet houses the incoming line from the 600-ampere propulsion feeder breaker.

Advantages of System

The arrangement of the power generating plant and the particular propulsion system employed offers many advantages for this application. It simplifies the hull structure, since the diesel generating sets can be distributed throughout the engine room, eliminating the concentration of heavy propulsion machinery. It also offers flexibility which cannot be accomplished by direct connected drives, since any one of the diesel generating sets can be used for propulsion and auxiliary power simultaneously. On account of the relatively large auxiliary load, it is important to note that this system makes the generated power available for the auxiliary and propulsion loads instead of using large diesel generating sets in duplicate to supply the auxiliary machinery, and a large slow-speed diesel for direct propulsion. It provides a wide speed range, both ahead and astern, and with moderate speed engines running at constant speed and in one direction, operation at reduced ship speed is accomplished with economical fuel rates. Full control from the pilot house adds materially to the safety and efficient operation of this vessel.

Operation Schedule

To illustrate the degree of flexibility of this system, it is well to consider a typical operating schedule. In going to the fishing grounds, the auxiliary load demands are at a minimum, and full generated power is available for propulsion purposes. When picking up bait, the bait tank circulating pumps are in service offering a moderate auxiliary load, and for this condition of

(Page 59, please)

A Streamlined

by E. A. Hodge

Marine Manager, The Pusey and Jones Corporation

The newest, smartly styled passenger-vehicular steamer to be added to the fleet of the Virginia Ferry Corporation for the run between Cape Charles and Little Creek, Virginia, is the twin screw steamer Pocahontas, which was designed and built by The Pusey and Jones Corporation of Wilmington, Delaware. She completed successful trials last January, during which her 1800 shp four-cylinder Unaflow steam engines easily drove her in excess of the shipyard's guaranteed speed of 16 knots. She was delivered at Little Creek, Virginia, on March 2, one full month ahead of the contract completion date.

Truly a luxury craft in all respects, and the largest in her owner's service, this new all-welded, fireproof ship must be ranked as the tops in attractive passenger facilities, carrying capacity and performance.

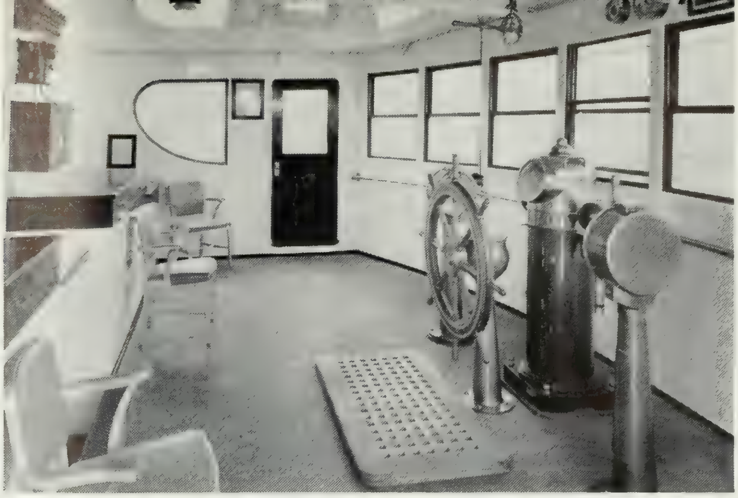
Her liberal beam of 65 feet provides for six lanes of vehicles, offering transportation space for as many as 110 automobiles, on the main (or vehicle) deck, which is well protected by heavy, weather-tight doors at the bow and folding bulwark-gates at the stern. More than usual deck height, supplemented by space economy in the arrangement of uptakes has greatly enhanced the facility of truck transportation as well; yet without sacrifice to the wide, easily pitched companionways which lead up to the promenade, or passenger, deck. This deck extends the entire length of the vessel, with a full width sun deck forward, and has been arranged to offer features of comfort and amusement that make the ship outstanding as a distinctive type. Particularly striking is the effective choice of pastel coloring in combination with modern furnishings and draperies.

A well appointed interior arrangement provides a glass enclosed dining saloon and lounge, a luncheon and oyster bar, a spacious furnished lobby, an unobstructed dance floor 60 feet long and 43 feet wide, with an enclosed orchestra platform at its forward end. The dance hall is flanked on both sides by sheltered, outside decks fitted with seats that face outboard. Aft of the dance hall is a separate saloon and adjoining open deck with ample seating capacity. In all of these spaces, the liberal use of plate glass windows in the interior as well as exterior bulkheads allows unobstructed view of the water on both sides from almost any position within these accommodations. A rail-enclosed platform forward of the bridge at the boat deck level offers elevated chair space, with full vision over the ship's bow. The crew is quartered and fed on the lower deck where provision is also made for the accommodation of truck drivers.

In design conception, the effort to produce a clean-cut outside appearance is quite evident in the elimination of cowl ventilators, unsightly deck ob-

Pocahontas on her trials shows easy water lines and trim appearance

Pocahontas



A spacious, wide-vision pilot house makes for safety and comfort

structions and kindred features which have been hitherto accepted as a necessity of the past. All ventilation is effected by mechanical means and the air is taken in, or discharged, as the case may be, by inconspicuous louvres streamlined into the exterior structure.

Well insulated by fireproof composition, entirely ceiled by panels, the ship is heated by the latest air conditioning equipment of the Carrier Corporation in the form of eight "Weathermaker" units fed by a 40 psi steam pressure and controlled by variable speed motors. To keep the ship cool in summer and odor-free in cold weather, electrically driven exhaust blowers, ranging in capacity from 600 cfm to 2,000 cfm variously located throughout the vessel, remove heated air from the victualing spaces, toilets and public rooms, drawing in fresh air from the numerous outside windows. Air change for the engine and boiler rooms is effected by eight discharge blowers, each having a capacity of 4,000 cfm powered with variable speed electric motors controlled in the engine room.

Without vibration over the full power range, the two four-cylinder (20½″ bore by 20″ stroke), 1800 shp marine Skinner Unaflow engines drive 8′6″ diameter, 9′3″ pitch bronze propellers at 215 rpm, through type GF-21 Kingsbury thrust bearings. Steam, at a throttle pressure of 300 lbs. per square inch, at 200 degrees superheat, is normally fed to the engines by two sectional header, single pass, water-wall, oil-fired, marine boilers, of Combustion Engineering Company make, each of which is capable of supplying 30,000 psi of steam per hour, which is more than adequate for full engine power. However, an identical third boiler is held in reserve, all three boilers being so arranged that any combination may be cut in as expediency demands but with the principal object of facilitating efficient maintenance without time loss in the schedule of the ship.

Individual to each boiler, is a steam driven 11,200 cfm Sturtevant fan which provides the required forced draft. Todd "Hex-Press" double casing air registers, with variable pressure atomizing burners, supplemented by fuel oil heating and pressure generating equipment are used for the consumption of bunker "C" fuel. Each boiler is capable of desuperheating 4,000 psi of steam per hour and all are equipped with Diamond soot blowers.

Both main engines exhaust at 26 inches vacuum into a common condenser having an effective cooling surface of 2,760 square feet through copper-nickle alloy tubes fitted into tube sheets of the same material. The air ejectors are of the Wheeler make, having a free air handling capacity of 65 pounds per hour. Water circulation is effected by a 14″ single stage turbo-driven Warren centrifugal pump capable of delivering 5,000 gallons of sea water per minute. Two electrically driven Warren 94 gpm pumps are used for condensate, one being for stand-by. Two vertical simplex 12″ x 7½″ x 24″ feed pumps of the same make are employed for the return of water to the boilers; feed water heating being accomplished by a Davis multi-coil unit with a capacity of 54,000 pounds per hour, from 100 degrees to 225 degrees.

Besides the two 7½ hp Schutte & Koerting electrically driven gear pump sets used for forced feed prime mover lubrication, the other ship's pumps include: two Warren fire-and-bilge pumps 14″ x 10″ x 12″ of the horizontal duplex type; one Westco, horizontal self-priming, electrically driven sanitary pump, 120 gpm; one cold fresh water 450 gph pump of the same type and one 30 gpm hot fresh water pump, also of the same type and make.

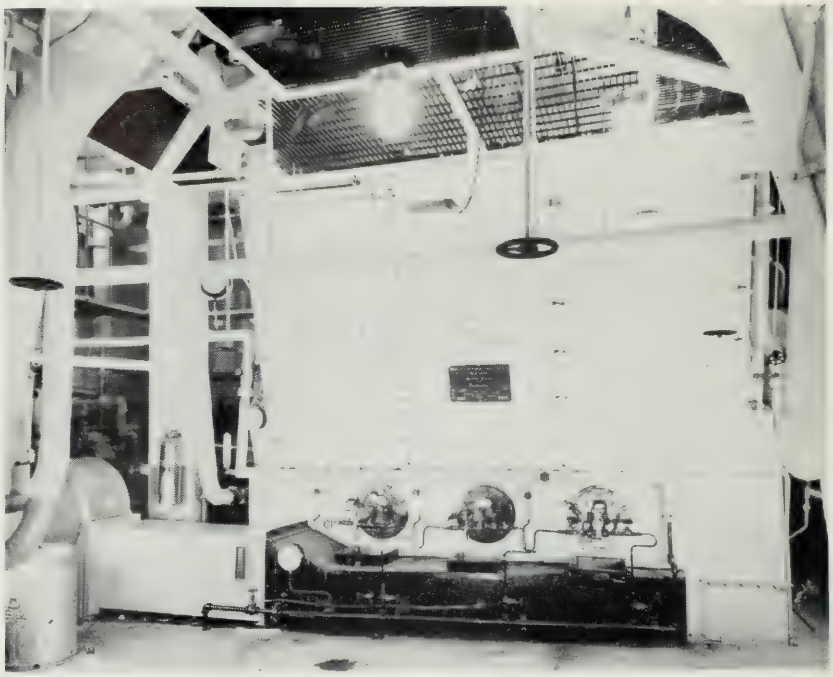
The lubricating oil is centrifuged by a No. 12 Sharples purifier. Two Cochrane 6,100-gallon capacity conical shaped oil removal filters, connected between the condensate drains and feed-and-filter tank, protect the feed water against oil contamination, the back-washing being accomplished by pressure-fed fresh water from feed pump connections.

The electrical power for all purposes

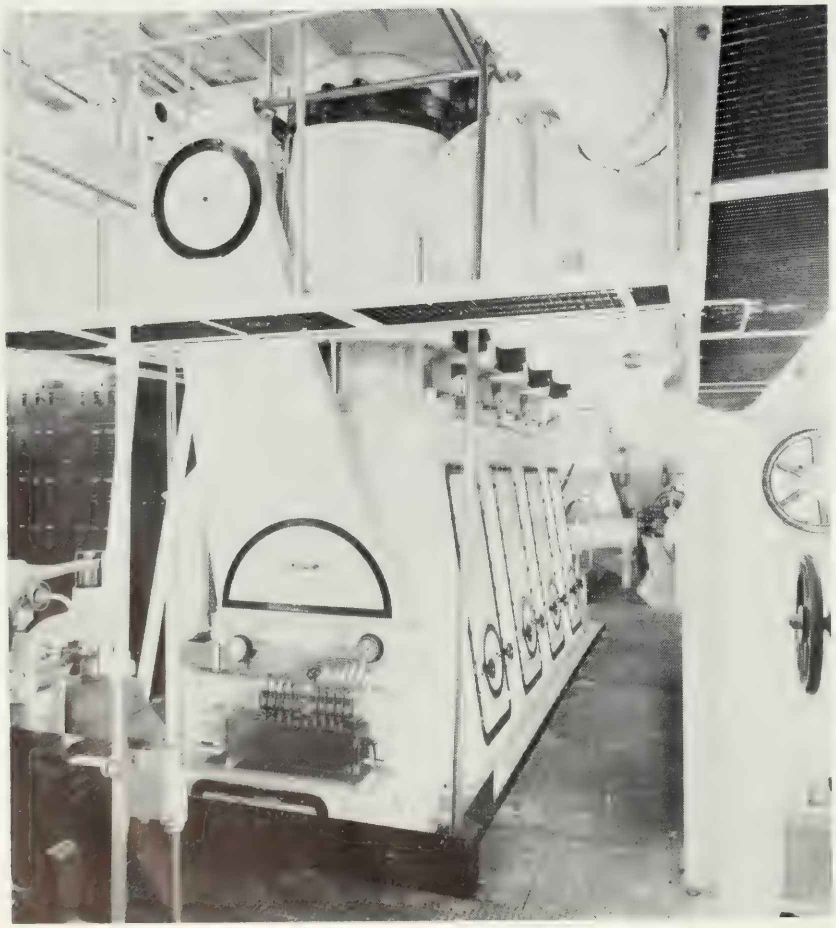
PRINCIPAL CHARACTERISTICS

Length, O.A.	300′0″
Length, B.P.	282′0″
Breadth at water line	46′3″
Breadth outside guards	65′0″
Molded depth	20′0″
Draft, mean, light, service	9′6″
Total shaft horsepower	3600
Speed	16.45 knots

Steam on the Pocahontas is generated in three Combustion Engineering Co. boilers at 300 psi and 200° F. superheat. Two of these boilers normally take care of operation, the third being a stand-by. The central boiler is shown here looking between the port and starboard boilers



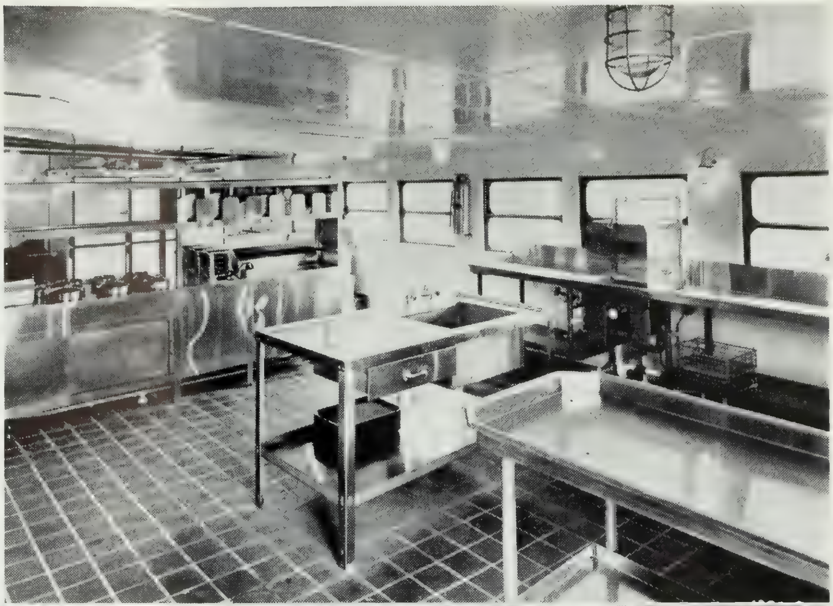
An Interesting Reciprocating Steam Drive



Here is shown one of the two Skinner Unaflow engines that drive the twin screws of the Pocahontas. Each of these engines has four cylinders, 20½" bore by 20" stroke and develops 1800 shp at 215 rpm when supplied with steam at 300 psi and 200° F. superheat and when exhausting into 26-inch vacuum. The performance of these engines is claimed to be vibrationless is produced by three self-contained, 50 kw, 110 volt, direct current Westinghouse generators driven by single stage impulse turbines operating on 300 psi of steam at 625 degrees total temperature. Power distribution is effected through the latest type dead-front switchboard, of Pringle manufacture, centrally located behind the main engine control station.

Throughout the public rooms and officers' quarters modern, indirect lighting is employed. Inter communication is by sound-powered telephone. A dual engine telegraph system and helm control allows the ship to be handled from either the pilot house or the after boat deck. For amusement purposes, a special high grade radio receiver distributes entertainment through a loud speaker system. For passenger use, as well as vessel operation, a ship-to-shore telephone system has been installed on the promenade deck.

Construction was commenced on the Pocahontas last March and her launching took place on September 16, 1940. Delivered to her owner fully furnished and in operating condition, her cost is understood to be in the neighborhood of $1,225,000, her owner having supplied to the shipbuilder all of the culinary equipment and expensive furnishings throughout.



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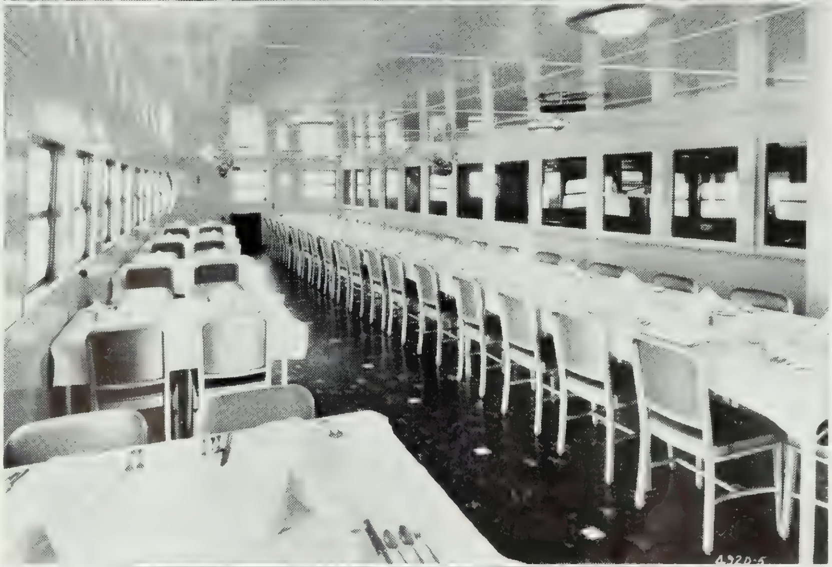
Top. A corner of the promenade deck galley which serves both the dining saloon and the lunch counter



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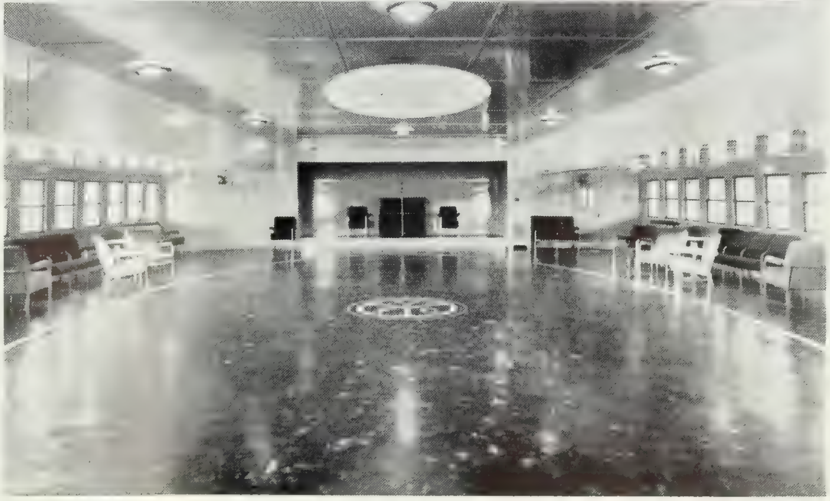
Center. The main dining saloon with tables set for the banquet given the shipbuilders by the owner before delivery



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Bottom. Unobstructed 43' x 60' dance floor with orchestra platform in background

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News FROM THE PACIFIC NORTHWEST

by Daniel L. Pratt

As of March 15th

Two Major Events

By the time this magazine reaches its readers, two events of major importance in shipbuilding activities in the Northwest will have been recorded and new ones will be in the offing. Imminent at the time of writing is the laying of the first destroyer keel in the now practically complete Seattle plant of the Seattle-Tacoma Shipbuilding Corp., first of 25 that are to be built by the Navy at a total contracted cost of $179,500,000. Also scheduled in the next ten days is the delivery by the Tacoma plant of this same company of the C-1 type carrier, the Cape Alava, the first to be completed in a Northwest yard under the Maritime Commission's program.

Yard Construction Records

With the new plant of the Seattle-Tacoma company completed, it is interesting to note the remarkable speed of its construction. Driving of pilings for the craneways was not started until October 6th, for the shipways October 11th and for the bulkheads October 13th. Dredging was begun October 4th with suction dredges and completed October 21st. The office building was started November 1st, mold loft structures December 5th, warehouse December 9th, the steel fabrication structure November 27th, power building December 19th and machine shop December 10th. Charles W. Fitton, engineer and constructor, who also had charge of the erection of the Tacoma plant, is given much credit by J. A. McEachern for his outstanding work at the Seattle plant, where not the slightest delay has occurred in spite of the yard's size and intricate facilities.

Cape Alava Completed

Virtually ready for sea, the new C-1 type motorship Cape Alava is expected to be delivered to the American Mail Line about March 21st. She was tentatively scheduled to be lifted at the Tood-Seattle Dry Docks for final bottom cleaning and painting March 19th, after which she was to make trial trips, probably March 20th or 21st. She is the first of two assigned to the transpacific service, the other being the C-1 Cape Flattery under construction at the same yard, and due for delivery in April. Motor tests of the Cape Alava have already been made at Tacoma. The 4,000-hp diesel engines were submitted to dock trials over a period of several days and engineers, inspectors and yard officials expressed enthusiastic approval of the performance, especially in view of the fact that the four other ships of this type, on order at the Tacoma yard, are to have the same power plants.

Five Tankers for Tacoma

Revealed in the announcement by R. J. Lamont, president of the Seattle-Tacoma Shipbuilding Corp., is the most important news of the month for the Puget Sound district, in the shape of an order for five Navy tankers which will be built at the Tacoma plant. These new vessels will cost about $2,000,000 each, and to handle them it will be necessary for the Tacoma plant to add two new ways and employ about a thousand new men. The tankers will be twin-screw motorships of about

M. S. Cape Alava leaving the Seattle-Tacoma Shipbuilding Corp. yard at Tacoma for delivery at Seattle

More Shipbuilding in Northwest

Late in the month, on March 23, it was announced that contracts for more than $10,000,000 in new naval auxiliary vessels had been awarded to Puget Sound yards and $2,500,000 to Oregon firms. These are allocated as follows:

Winslow Marine Railway & Shipbuilding Company of Seattle, with plant at Winslow on Bainbridge Island, for steel mine sweepers, $7,500,000.

J. M. Martinac Shipbuilding Corporation, Tacoma, four wooden mine sweepers, $1,250,000.

Tacoma Boat Building Co., Tacoma, four wooden mine sweepers, $1,250,000; Western Boat Building Co., Tacoma, two mine sweepers, $650,000.

Eight 135-foot mine sweepers have been awarded to Oregon plants, four to the Astoria Marine Equipment Co. and four to Kruse & Banks, North Bend.

300 feet length and from 18 months to two years will be required to complete them. From 1500 to 1800 men are already employed at the Tacoma plant where a fleet of eleven ships is under construction for the Maritime Commission. Mr. Lamont said that negotiations for the construction of two great luxury liners which could be converted into aircraft carriers was still in progress but had not yet reached a definite stage. The two vessels would cost about fifty millions.

Yale To Be Floating Hotel

The 35-year-old famous passenger steamer Yale, once the pride of the California coastwise service, has been sold by the Matson Line to the Seims-Drake-Puget Sound Co., contractors on several Alaska airports, who plan to use her as a floating hotel for workmen. She has been moved out of the boneyard near Antioch, Calif., taken to the Moore Dry Dock Co., Oakland, Calif., to fit her out for sea duty, and her next stop will probably be Seattle where she will be refitted for the purpose for which she is to be used.

Coast Guard Radio Station

Plans for a new $220,000 radio station for the U. S. Coast Guard on Puget Sound have been approved by Capt. W. H. Munter, district commander at Seattle. The site selected is a 100-acre tract in the Meadowdale district about five miles north of Edmonds—about 20 miles north of Seattle. Work on the new station is expected to start about July 1st and to be completed by fall. There will be a building housing the most up-to-date equipment available, a barracks for a crew of fifteen men, and smaller buildings for storage.

Alaska King Crabs

Several boatloads of scientists and fishermen have left Seattle for Alaska to make further surveys of possibilities for developing a King crab industry. Last fall the fishing boat Dorothy brought some of these denizens of the deep back to Seattle after a cruise made in the interest of the United States Fish and Wildlife Service. They ranged up to 16 pounds in weight, with leg spread of 54 inches. The Government is interested in establishing an Alaska King crab canning industry to compete with the Japanese, who have been importing much of the product into our markets. The purse-seiners Champion and Locks, equipped with otter trawl and tangle nets, sailed recently to carry on the research and the Dorothy left on her second trip February 16th.

Kvichak Sinks in Deep Water

It was hoped for a time to save the U. S. Army transport Kvichak, reported in the last issue as wrecked in northern British Columbia, but a sudden and untimely gale on March 5th swept the vessel off into 80 feet of water. The Pacific Salvage Co. of Vancouver, which undertook salvage operations had moved the vessel 100 feet in an effort to refloat her and with favorable weather for another 24 hours might have saved her. Under present conditions salvage operations have been abandoned. The vessel went on Sisters Rocks, Finlayson Channel, on January 27th while en route from Seattle to Alaska with a large cargo of equipment and supplies for Alaska Army airports.

Cradle and All

When a boat is cradled before being lifted for stowage on a steamship—that's routine. But when a vessel is put in her cradle at her home port and then proceeds 24 miles in the cradle under her own power—that's news. And that's just what the Foss Co. did with their Foss No. 11, a 50-foot diesel tug which they recently sold to the Navy. The boat was cradled at their Tacoma yard, then with her 200-hp diesel engine, proceeded, cradle and all, at a speed of about 2 mph to Seattle, where she was loaded aboard the Makiki of the Matson line for delivery in Manila.

Ship-Shore Phones

Owners of vessels operating out of Seattle and Portland and carrying radio-phone equipment have been notified by the Pacific Telephone and Telegraph Co. of the opening of new stations at Portland and Astoria. Portland's station will be KQX and Astoria's KFX. The new stations are available to vessels in the Columbia River and along the Washington and Oregon coasts, will transmit on 2598 kilocycles and receive on 2206 kilocycles.

Adding To Seattle's Harbor

The contract that has been let to the Puget Sound Bridge & Dredging Co. to dredge out Sammamish River, which connects Lake Washington and Lake Sammamish, although primarily a flood control measure, also has a commercial significance. Lake Sammamish, lying east of Lake Washington, is about sixteen miles long, and the dredging and straightening out of the slough that connects them will at least make the channel navigable for small boats and scows, thus adding for certain types of commerce over forty miles of deep water frontage to the Seattle Harbor area.

The yard of Lake Union Dry Dock and Machine Company is a very busy place, reconditioning and repairing many ships in addition to the big job of converting the passenger and cargo liner City of Newport News into a transport

Marine Shorts

The Austin Co. has been awarded a $677,500 contract by the Navy for construction of two naval submarine net depots, one at the new Naval ammunition depot at Indian Island near the entrance to Puget Sound and the other at the Naval fuel depot, Middle and Orchard Points at the entrance to Rich Passage on the way in to the Bremerton Navy Yard.

* * *

Appropriation of $750,000 for three new major light stations in Alaska have been recommended in Congress. They would be established by the **Coast Guard** at Caton Island, Cape Edgecumbe and at Smith Island in Prince William Sound. Each would have powerful landfall lights, radio beacons and fog signals.

* * *

Units of the fleet of the **Coast and Geodetic Survey** will start leaving for Alaska about April 15th. The survey ship Explorer, newest and finest of the fleet, is at the plant of the Lake Union Drydock & Machine Works overhauling in preparation for her second season's work. The vessel showed a high degree of efficiency last year. This season she will again go to the western Aleutians and will be under command of Commander F. B. T. Siems. She was built in Seattle by the **Lake Washington Shipyards.**

* * *

1941 regulations as announced by **Secretary Ickes** gives Alaska fishermen 12 to 24 more hours a week to take their catch this season in the north.

The well-known steamship **Silverado** of the **McCormick Steamship Co.** has been chartered by the Quartermaster Department of the Army. She will load two full cargoes of lumber from the Columbia River for the Hawaiian Islands. Slated to be operated as a transport, it is understood that she will be manned by officers and crew selected by the Army. A total of 8,000,000 feet of lumber, it is understood, will be purchased in the Northwest for Hawaiian delivery.

* * *

It is reported that four of the steam-driven turbine vessels being fabricated at the **Seattle-Tacoma Shipbuilding Corporation's** Tacoma plant have been purchased by the **Isthmian Steamship Co.,** a subsidiary of the U. S. Steel Corporation. The vessels are of the C-3 type, the largest and fastest cargo vessels built under the Maritime Commission program.

* * *

The **Alaska Line's** freighter Columbia has been at Todd's for overhauling previous to being placed in service March 22nd, two months earlier than usual. This has been made necessary by the company's decision to run three sailings a week to Seward instead of two as in the past. The Columbia will make her first sailing to Nome, as usual, leaving Seattle May 30th.

* * *

Going north aboard the steamer **Yukon,** sailing from Seattle on March 8th, was John B. Wilson, chief engineer of the motorship **Boxer** of the U. S. Bureau of Indian Affairs. The Boxer was frozen in near Bethel last fall after she was disabled by a broken propeller. Mr. Wilson will go to Seward on the Yukon, thence by rail to Anchorage and by airplane to Bethel. A Government vessel will tow the Boxer back to Seattle for overhauling and outfitting for this season's service.

* * *

The 25-year-old wooden steamship **Redwood City,** built by the **Pacific American Fisheries,** has been purchased by the Army and will be converted into a transport to take the place of the recently wrecked Kvichak. She is to be prepared for service by the **Lake Union Drydock & Machine Co.**

Personal Gleanings

A. H. Beisel, general freight and passenger agent of the U. S. Lines at Seattle, was host to a group of seventeen transportation leaders from Seattle and Portland at the recent ceremonies upon the arrival of the company's new liner America at San Francisco. . . . **John Barthrop,** district freight agent for the McCormick Steamship Co. at Seattle and first lieutenant in the Coast Artillery Reserve, has been called for a year's active service with the transport division, quartermaster's department and reported for duty March 6th. . . . **Ivor James,** G. P. A. of the Northland Transportation Co., just returned from a month's swing through California where he contacted various travel bureaus and agents, and reports that from his observations, tourist movement through the Northwest and Alaska will not only be heavy this summer, but may possibly break all previous records. . . . **H. C. Hanson,** Seattle naval architect, after a short sojourn at home, left again recently for Washington to continue the campaign to obtain for Northwest boat builders a share of the contracts for small wooden auxiliary vessels. Mr. Hanson represents **Associated Boat Builders** of Washington and Oregon. . . . **W. C. Nickum,** naval architect of Seattle, has been in Washington on a similar mission with representatives of the **Seattle Shipbuilding & Drydock Corporation** and the **Ballard Marine Railway Co.** Mr. Nickum has been very active in connection with maritime and Navy work and is maintaining a large staff in Seattle.

M. S. Gotham

New Diesel-Electric Auto Ferry For New York Harbor

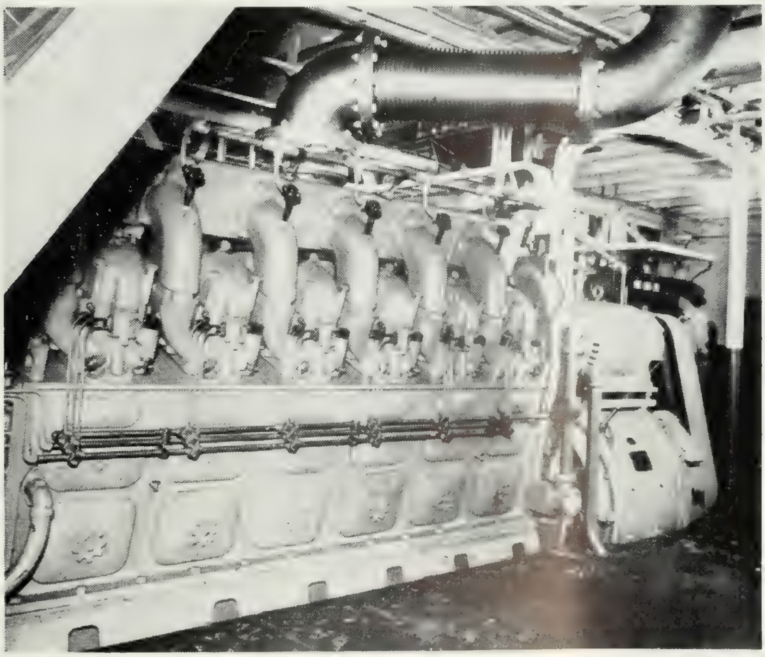
Captain Thor Bjortness in the pilot house of M. S. Gotham

The Gotham, a new 185-foot diesel-electric ferry to be operated by the Brooklyn-Richmond Ferry Company on the run between 69th Street, Brooklyn, and St. George, Staten Island, passed all her tests during extensive trial runs on March 12 on Long Island Sound. A 950-horsepower General Motors diesel engine generates the electric power which drives the hull. She is the third of four vessels on the line's building program, and was launched in January at the Jakobson Shipyards, Oyster Bay, Long Island. Speed trials were made over a half mile course and the average of windward and leeward runs gave 12.7 miles per hour.

The ship carries two 3000-gallon tanks of oil and is designed to use 100 gallons of oil per hour. She has a draft of eight feet six inches empty and nine feet six inches when fully loaded. The GM diesel installed is a two-cycle 12-cylinder model. The complete power plant, including generator and all electric propulsion equipment, was furnished by General Motors.

This plant is so compact that the engine room contains ample space for the engineer to care for any part of his machinery. According to ferry line officials the ship should make the 69th Street run in about ten minutes.

Representatives from the Electric Ferry Company, General Motors Diesel Engine Division, Jakobson Shipyards, and Eads Johnson, Inc. (Marine engineers and naval architects), designers of the ferry, made the trip along with two members of the United States Steamboat Inspection Bureau.



Propulsion power for M. S. Gotham is generated in this V-12-2 cycle General Motors diesel engine

NORTHWEST NEWS

(Continued from page 52)

. . . **Commander A. M. Sobieralski** of the U. S. Coast and Geodetic Survey has been acting inspector in charge of the Seattle station temporarily succeeding **Commander F. H. Hardy** who is on leave. . . . **Coast Guard Capt. Geo. W. David,** engineer officer of the Seattle district, after a service of thirty-nine years, will be retired June 1st. He is now on leave which will extend to June 1st when he will relinquish his duties, having reached the retirement age of 64 years. He will be succeeded in this district by **Commander Henry Charles Roach** who will be sent to Seattle from New York April 15th. . . .

News FROM THE PACIFIC SOUTHWEST

by **K. M. Walker**

CALIFORNIA SHIPBUILDING CORPORATION

An 86-acre tract on Terminal Island, bordering on Cerritos Channel (the waterlane separating the island from the mainland and connecting Los Angeles and Long Beach inner harbors), is now rapidly taking form as a modern eight-way shipbuilding plant. This is one of seven new yards financed by National Defense funds and designed to build the 200 standard cargo vessels which the Commission has ordered as emergency tonnage.

The Bechtel McCone-Parsons Corporation are building the yard including bulk heading, piers, ways, trackage, cranes, shops and offices. It is claimed that orders for equipment, tools and material total over $2,500,000. Thirty-one of the standard cargo vessels have been assigned for construction to the California Shipbuilding Corporation who will operate the yard.

Work is being rushed on this $5,000,000 plant, with day and night shifts going full blast, and it is predicted that the first keel will be laid in June.

John McCone, president of Bechtel McCone-Parsons is president also of the California Shipbuilding Corporation. The 31 standardized cargo vessels will cost, it is estimated, approximately $50,000,000.

PORT OFFICIALS MEET

The California Association of Port Authorities met on March 7th at Los Angeles and amended their working agreement to provide for a standard committee on tariffs and port practices. The amendment provides that this committee shall consist of the officials of the member bodies who actually handle traffic matters and that it shall annually elect its own chairman and vice chairman.

A coordinating committee from the North West Marine Terminal Association will consider matters of mutual interest affecting the whole Pacific Coast. Members appointed to this committee are: J. F. Marias, chairman; A. H. Abel, F. D. Parr, G. H. Moore and W. D. Lamport.

President Arbogast, owing to pressure of private business, tendered his resignation. The association refused to accept it until the end of his term of office and recommended that its executive committee arrange for the continued affiliation of Arbogast with the association in recognition of his three years' service in helping lay the foundation for the inter-port agreement which recently received approval by the U. S. Maritime Commission.

NEW BETHLEHEM YARD AT SAN PEDRO

The Bethlehem Steel Company, Shipbuilding Division, was granted a permit by the U. S. Engineers office to construct additional shipbuilding facilities at its present ship repair plant on the east side of the main channel of Los Angeles harbor. This permit was granted after all parties interested had been advised of the proposed plans and invited to file any objections based on navigation interests.

According to the plans broadcast by the U. S. Engineers office, it is proposed to build a bulkhead wharf, an outfitting wharf, launching ways and an extension of the existing slip. It is also proposed to dredge to a 30-foot depth and to use the material dredged for a fill back of the bulkhead wharf. The plan shows two large shipbuilding ways, each of which is 100 feet wide and will take two destroyers side by side. On each side of each way is a tower crane track way 26 feet wide. Between the two central crane ways is a welding slab 42 feet wide extending the full length of the ways. On the south side of the southern crane way is a similar welding slab.

Shipbuilding Flash

As we go to press, comes the cheering news that Southern California firms are being awarded contracts for the construction of auxiliary craft for the U. S. Navy.

The Carson Boat Company of Terminal Island, Los Angeles, is to build two mine sweepers at $650,000 for the pair. The **San Diego Marine Construction Co.** is allocated four large sweepers for a total of $1,300,000. The **South Coast Company,** Newport Beach, has an order for six sweepers with a total cost of $2,000,000. The **Harbor Boat Company,** East San Pedro, pulled down a contract for four sweepers at $1,300,000.

These are all of wood construction. The four contracts total $5,250,000.

With this arrangement of shipbuilding facilities, the San Pedro plant of Bethlehem will be able to erect four destroyers or two large commercial hulls simultaneously and will have ample outfitting dock space to take care of these hulls in the water.

FIRST NAVAL LAUNCHING IN LOS ANGELES

Harbor Boat Building Co. of Los Angeles, with a finely equipped yard on Terminal Island, is making rapid progress on a group of 15 boats for the U. S. Navy. The censorship on naval work these days will not permit us to say more about these craft than that they are 60 feet long and self-propelled.

The first boat was launched on March 8 and she is the first U. S. Navy craft launched at Los Angeles Harbor since the former World War.

SECOND C-1 LAUNCHED AT CONSOLIDATED

On March 27, the Consolidated Steel Corporation yard on the Long Beach inner harbor channel, launched the second of four C-1 cargo steamers being built for the U. S. Maritime Commission. This vessel has been allocated to the New York and Cuba Mail Line and was christened Agwiprince by Mrs. Edward B. Simmons, niece of Robert Stone, the president of that line.

Launching at this yard is by the sidewise method and the way is long enough so that the whole of one vessel and part of another are simultaneously under erection. Thus, when Agwiprince slid off into the channel, more than half of the hull of the third ship was left on the way. The keel for half of the fourth ship and for the rest of the third ship were promptly laid in the vacated space.

Agwiprince was shunted to the outfitting dock alongside Cape Mendocino, the first of the quartet. This latter ship is scheduled for official trials toward the end of the month.

FRANK HIGBEE PROMOTED

Lieut. Comdr. Frank Higbee, U. S. Coast Guard, has for some time been in command of the San Pedro Coast Guard as assistant to Captain L. L. Bennet in charge of the Los Angeles district. Higbee has now been promoted to Captain of the Post in charge of enforcing harbor rules for ports of Los Angeles, Long Beach and San Diego.

News From San Diego

HARBOR IMPROVEMENT

While San Diego Bay has been long recognized, by those who follow the sea, as one of the world's greatest natural harbors, the prevailing shallow water has precluded its full use by deep draft vessels. To overcome this, six big dredges are now at work pumping mud from as many different areas and depositing the dredged material along the shores to create new land and reclaim marsh areas. Of the original area of twenty-two square miles, less than half has been of use to any but shallow draft vessels. This area will be reduced to about fifteen square miles, through the deposit of dredged soil to create new shore lands, but all of the fifteen square miles will eventually be deep water. A charter appropriation of $150,000 annually for port development is now matched almost five to one by Government funds and the result is a rapid stepping up of the original program.

The big dredge Tualatin is operating at the channel entrance to cut off the tip end of North Island and straighten the entrance. Another is dredging at the foot of E Street to fill the base of the new pier being built immediately south of the Broadway Pier. Others are at work in both the north and south ends of the bay on a program which, even with the Government carrying the heavy end, will require years to accomplish.

FLEXIBLE COUPLINGS FOR TUNA CLIPPERS

When Guy Silva's tuna clipper Emma R. S., which sustained a broken crankshaft on her last voyage, was laid up at the San Diego Marine Construction Company's shipyard, Capt. Silva took advantage of the opportunity to design and install an ingenious flexible coupling at the tail shaft and another at the thrust shaft. This coupling utilizes a series of radial pins recessed into the face of the coupling flanges and fitted with rubber bushings. It absorbs thrust in both directions and will accommodate variations in alignment, both angular and axial, within all possible limits of change in hull shape. Tuna vessel owners are watching this improvement with marked interest and, if generally adopted, it should materially reduce the heavy towing bills and repair costs shouldered by underwriters.

YARD NOTES

The **Martinolich Shipyard,** which moved from Tacoma to San Diego the latter part of 1940, is developing toward a yard of major importance. The new foundry is nearly finished and soon will pour the first heat. A new 2000-ton marine railway is under construction and the piling and concrete work of the centerline pier is finished. When this railway is completed it will no longer be necessary for the Coronado ferries to make the voyage to San Pedro for drydocking. The 800-ton marine railway is being kept busy and as this goes to press the tuna clipper Azoreana is on the blocks having a new keel installed. She is also being rebuilt aft and a new stern, of the long compromise overhang type, added.

The **Harbor Boat Works** has been awarded a contract for the construction of an eighty-foot, twin screw, wooden hull patrol boat for the Mexican Government. Two 400-horsepower diesel engines will give her a speed of about twenty miles an hour. The design of the hull has been placed entirely in the hands of Peter Rask, head of the Harbor Boat Works, and the lines of the model are of a modified "V" bottom. This is rumored to be the beginning of a construction program by the neighboring republic and if this little ship proves satisfactory others of the same, or improved and larger design, will follow.

The Campbell Machine Company yard is loaded with Government work as well as its usually heavy run of repair work. The big clipper Belle of Portugal is having her stern remodeled and lengthened to the lines of the new overhang compromise type.

LARGE DEVELOPMENT IN GUAYMAS

The Mexican motorship Nando Junior recently left San Diego with material and equipment for the construction of the new **Construccione Navales de Guaymas** shipyard to be built at Guaymas, Sonora, Mexico. **Gabriel Milhe,** San Diego purchasing agent of the **Marine Products Company,** has been appointed an executive of the new Guaymas shipyard.

Gen. Abelardo Rodriguez, former president of Mexico, who recently purchased nine Puget Sound trawlers to be used in the shrimp fishing industry in Mexican waters, has contracted with the new Guaymas yard for nine more large shrimp boats.

The Mexican Government also has placed orders with the new Guaymas yard for several coast patrol boats.

Cramp Yard Revived

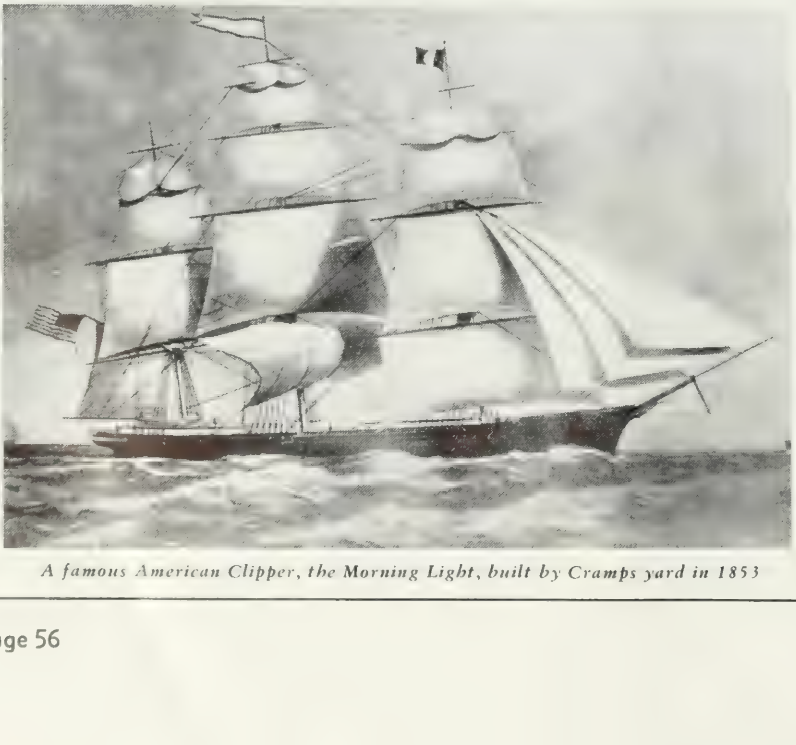
One of America's Pioneer Shipyards Revitalized After Thirteen Year Coma

With a contract to build six light cruisers for the U. S. Navy at a cost of $120,000,000, a newly organized Cramp Shipbuilding Company has taken over the old site of the Wm. Cramp and Sons Ship and Engine Building Company and is transforming that old plant into a new shipbuilding establishment equipped with all the tools and the technical organization necessary to turn out modern commercial and naval vessels.

Cramp's yard, when it closed in 1927, was the oldest yard on the Delaware and, in point of continuous activity, perhaps the oldest in the United States. The original Wm. Cramp who founded the yard was born in Kensington, a suburb of Philadelphia, in the year 1807 during the presidency of Jefferson. He was the son of a ship carpenter and in 1830, after a severe course of training as an apprentice, journeyman and finally master ship carpenter, he opened his own yard at Kensington in 1830.

Here the Cramp family built seagoing vessels for three generations of American shipowners. The products of this yard were among the outstanding ships in every class and in every era of the century during which the yard was in operation. The clipper ship era, the side wheel era, the iron hull era, the fast liner era, the coal burning Scotch boiler reciprocating period, the oil burning water tube boiler turbine developments and the diesel drive motorship economy were all taken in their stride by this versatile and skillful organization.

More than half a thousand ships slid off the ways of the old yard and their name roll in American overseas trade and American naval engagements would spell a complete history of America at sea.


A famous American Clipper, the Morning Light, built by Cramps yard in 1853

Now, after 13 years of idleness, this yard is again the scene of intense activity under an organization of business men and shipbuilders well calculated to give a renewed lease on life for perhaps another century.

As president the new organization has chosen Mr. James Reed, a name very well and favorably known in shipbuilding circles on both coasts. Best known on the Pacific Coast for his spectacular work as superintendent of construction at Mare Island Navy Yard from 1915 to 1920 and for his efficient management of the Golden Gate Bridge and Highway District during the period 1933-37 of construction of the world's longest single span suspension bridge; he had also, during the period from 1920 to 1933, held the office of General Manager in the Los Angeles Shipbuilding and Dry Dock Co., 1920-23; the Celite Corporation, 1925-29, and the Schlage Lock Company, 1929-33. His long and varied experiences in shipbuilding, in manufacturing and in general industrial affairs should be of great value to the new firm.

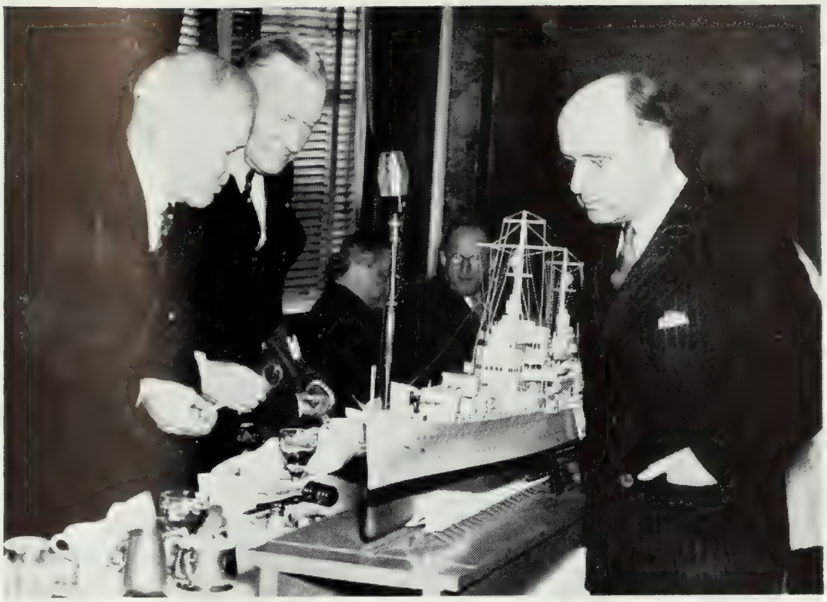
Tying the new firm into the old Cramp tradition, is the Vice President and Director, H. Birchard Taylor, great grandson of Wm. Cramp and a competent naval architect and marine engineer who came up through the various grades in the old Cramp yard.

Joseph P. Ripley, President of Harrison Ripley and Co., bankers, is on the board of directors. Rear Admiral Wm. E. DuBose, U. S. Navy Ret., is chairman of the executive committee. Commdr. Ralph Weyerbaker, U. S. Navy Ret., and formerly of the Navy Bureau of Aeronautics, is General Manager of the Cramp Shipbuilding Company.

It is now expected that the keel for the first cruiser, Hull No. 531 of Cramps yard, will be laid about July 1st, and that shortly thereafter the yard will be under full steam ahead orders with from 2,500 to 4,000 men on the payroll.

Delivery of cruisers is scheduled to start January 1, 1944, with a bonus for delivery ahead of time and a penalty for delay. The entire organization is being keyed-up to get the maximum bonus.

We know we speak the thought of the entire American shipbuilding fraternity when we extend to the Cramp Shipbuilding Company a cordial welcome and hearty wish for the good success that they so richly deserve.



Mr. James Reed (right), president of Cramp Shipbuilding Company, with Admiral Wm. G. Du Bose, U. S. N. Ret. (left), chairman of Executive Committee, and H. Birchard Taylor, vice president, examining the model of a scout cruiser

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Inspectors and Coordinators Needed by U. S. M. C.

Coordinators

The United States Civil Service Commission has announced an examination for construction inspection coordinator in the United States Maritime Commission. The salary is $3,800 a year. Applicants may qualify in three optional branches: Hull, electrical and machinery. The maximum age limit is sixty-five.

Applicants must have had 4 years of practical experience of at least journeyman mechanic grade on the construction or repair of ocean-going vessels. Successful completion of college study in naval architecture or any branch of engineering may be used for part or all of this general experience. An additional 4 years of experience in supervisory capacity is required. Two years of the total experience must have been gained in construction work on new vessels, while the remaining experience may have been on repair of ocean-going steel vessels.

Persons appointed will serve as head of the hull, electrical, or machinery units of the inspection branch of the Maritime Commission. They will act as liaison officers between the home office and shipyards at which vessel construction is under way in order to establish and maintain uniformly high standards of construction and of equipment installation.

Inspectors

Ship inspection positions, paying from $2,300 to $3,800 a year, are open in the Maritime Commission. An examination to secure these inspectors has been announced by the United States Civil Service Commission.

There are hull inspection positions involving shipfitting, welding, tank testing, and mold loft work. Machinery inspectors will be concerned with the installation of marine machinery, aligning shaftings, checking clearances, refrigerating machinery, and windlasses. The electrical inspectors will inspect the installation of electrical equipment on ships. The inspection of installation and construction of ship joiner work, including noncombustible materials, will be the job of joiner inspectors.

Applicants for all these positions must show that their experience has included the interpretation of specifications and the making of such computations and accurate measurements as are necessary to determine full compliance of work with plans. Responsible, practical experience in ship construction, involving the type of work pertinent to the duties of the position applied for, is required. Under certain conditions, a partial substitution may be made of college study. The maximum age limit is 65 years.

Although applications will be rated as received at the Commission's Washington office, qualified persons are urged to file their applications at once. Further information and application forms may be obtained at any first or second-class postoffice, or from the U. S. Civil Service Commission.

S. S. Marina Launched

First Sidewise Launching on Atlantic Coast in Over Twenty Years

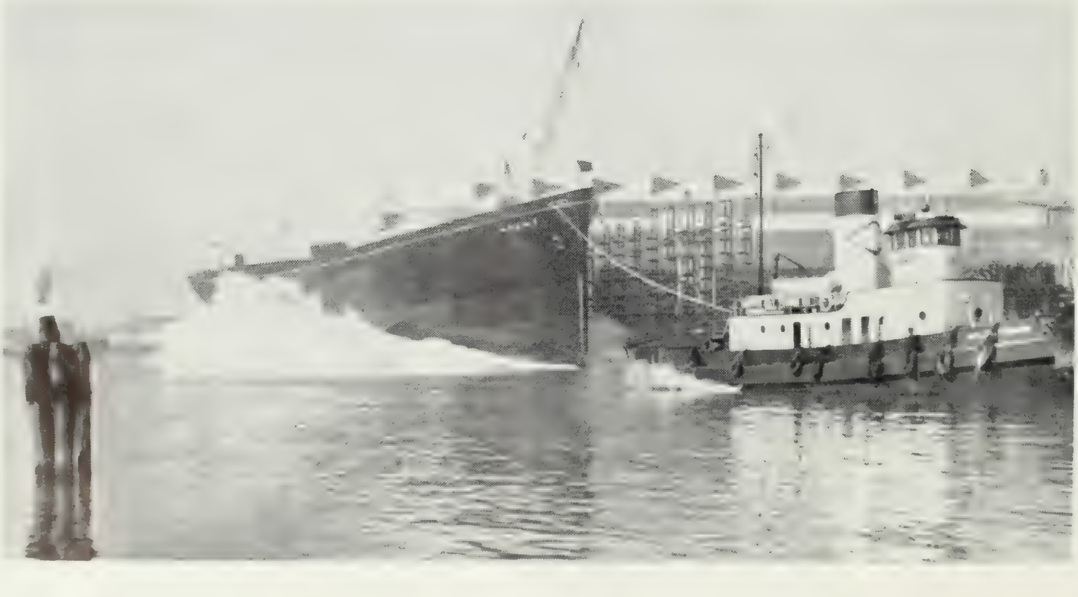
On Lincoln's Birthday, February 12, The Pusey and Jones Corporation used their new side launching ways at the Wilmington, Delaware, yard for the first time with signal success when the 400-foot, 4400-hp, single-screw, steam-propelled combination passenger-cargo ship Marina serenely, but all too quickly for the spectators, slid down into the Christiana River at 11:23 o'clock in the morning in the presence of a notable gathering of steamship and Government officials.

From the time the ship commenced to move until she tilted off into the water, only 6⅗ seconds elapsed, according to Edward A. Hodge, marine manager of the shipyard, who was in charge of the launching and the preparations which led up to the initial attempt of the builder to put a ship overboard sideways in a two-knot current and check her before she should reach the opposite bank of the river.

After all of the keel blocks were removed, the ship was held by four triggers at each end. The hull was then jacked riverward about one inch to tighten the trigger ropes, which were simultaneously cut, upon coincident signal to the sponsor, by pneumatic knives, actuated the instant Mr. Spiegelhalter, president of The Pusey and Jones Corporation, threw the master control lever. All operations were carried out by a system of electric and sound signals from a central control stand and every step in the launching came off exactly as scheduled without the slightest damage to the vessel or any part of the launching gear.

This was the first time since the last war that a side launching has been attempted on the eastern Atlantic seaboard.

The keel of this C-1-A type ship was laid last April under a $1,928,000 contract awarded to the builder by the United States Maritime Commission in November, 1939, following which, the vessel was purchased from the



S. S. Marina entering the Christiana River 6⅗ seconds after her release. Tugs at bow and stern checked her before she had travelled 250 feet. There is a two-knot current in the river at this point

Mrs. Jaun P. Domenech, sponsor, had a nice enclosure of her own where she could get a healthy swing on the bottle

Government by A. H. Bull & Company of New York, and has since been altered in many respects for the particular service requirements of this line, including among other features more passenger accommodations, heavier cargo gear, special cargo ports and refrigerated cargo space.

Mrs. Juan P. Domenech, the daughter of A. H. Bull & Company's vice president, Miguel Such, christened the steamer. Mr. Such is general manager of the line's West Indies operation and came from Puerto Rico to attend the launching. The Marina will enter the steamship company's New York-Puerto Rico service in May of this year.

When loaded, the ship, which is of the shelter deck type, will displace 11,000 tons and will maintain a cruising speed of 14 knots at a 23-foot draft. Her 60-foot beam and molded depth of 37½ feet will give her a cargo capacity of 7400 tons in five cargo holds, in addition to which she will carry 11,000 cubic feet of refrigerated cargo.

Her total complement will be 59 persons, of whom twelve will be passengers. Her accommodations throughout are of ultra-modern design, totally fireproof and equipped with incombustible furnishings.

Two Babcock & Wilcox water-tube boilers, each capable of generating 18,500 pounds of steam at 450 pounds per square inch pressure, will actuate a high and low pressure Allis-Chalmers turbine set, turning the single propeller through a Falk double reduction gear unit. This plant produces propulsion power at the economical fuel rate of 0.61 pounds per shaft horsepower per hour. The majority of Marina's auxiliaries are electrically driven through power from two 250-kw turbo generators, which also provide current in port to operate the fourteen electric cargo winches.

S. S. Marina ready to slide down the ways, exhibits the beautiful symmetry of line and finish that is characteristic of Pusey and Jones hulls

An A-C Success

(Continued from page 45)

operation it is desirable to cruise at very low ship speed for several hours. While following the tuna schools and fishing is in progress, the refrigeration loads are rather high; however, under these conditions, the speed of the vessel varies with the movement of the school so that the propulsion load varies considerably. Finally, with a full cargo requiring a substantial refrigeration load in addition to other auxiliary load, the generating plant has sufficient capacity to propel the vessel at 80 to 90 per cent of its "light" running speed.

Refrigeration

The refrigeration process includes three definite operations, namely, primary cooling, sharp freezing and dry storage. The tuna are caught by pole and line, and are immediately passed uncleaned through the main hatch to one of the 14 storage tanks containing water cooled to 28° F. This removes the body heat. The chilled sea water is then pumped out of the tank and zero brine substituted, lowering the temperature to 20° F. within a few hours. After the fish are lowered to the same temperature, all brine is drawn off and further refrigeration is maintained by ammonia coils until the temperature reaches 8° F.; thus the fish are kept in dry condition until unloaded in port. The storage tanks are insulated with 4-inch sheet cork.

List of Auxiliary Motors

	No.	*Hp*	*Rpm*	*Volt*	*Phase*
Refrigeration Compressor	2	40	1750	440	3
	1	40	1750		
Bait Pumps	2	25	1150	440	3
Condenser Pumps	2	10	1740	440	3
Brine Pumps	2	10	1740	440	3
Bilge Pump	1	10	1740	440	3
Brine Circulating Pumps	14	3	1160	440	3
Ammonia Compressor	1	1½	1160	110	1
Fuel Transfer Pump	1	¾	1725	110	1
Fathometer M. G. Set	1	1½	1725	440	3
Blowers (Pressure)	2	¾			
Blower (Exhaust)	2	½			
Deck Pump	1	1	1750	110	1
Steering Gear	1	1	1750	440	3
Anchor Winch	1	10	850	440	3
Cargo Winch	1	7½	795	440	3

Additional motors for the compressed air and fresh water systems and the lighting load brings the total connected load to approximately 300 hp.

A couple of Beachcomber Scouts off Indo-China

Beachcombers Loot

Flotsam and Jetsam

From Here and There

Hail and Farewell

Much to the surprise of everyone, our friend the beachcomber turned up the other day, rather seedy and gaunt looking but still his old cheerful, carefree self. On inquiry, we found that for the past two years he had been roaming the South Pacific and India Ocean beaches and that the going was rather "tough."

Said he, "Almost every beach down that way is either a military reservation or is being surveyed by a transpacific or inter-island airways corporation. 'Move on' signs are everywhere. You have to watch your step or else. I have picked up a few yarns, but don't ask me to document them. Documentary evidence, foot notes, and formal proof are all alike—detestable. Where I find any attempts at such, I promptly use them as fuel to cook a meal. Here's your stuff. I'm off to those new naval bases on the Aleutians, where I have a job keeping the sea lions out of the grub stores." With that he dumped a large package of miscellaneous manuscripts and pictures on the desk and was gone. Here and in subsequent issues we are reproducing some of the contents.

RECORD SAIL RUNS CALIFORNIA TO AUCKLAND

I was walking along a beach near one of the suburbs of Auckland, when I met a dapper old Scotch gentleman who joined me in conversation. He introduced himself as Mr. Thomas Henderson. As we chatted, it came out that he had been born in Auckland, and that he and his father before him had been shipping agents there.

"Then," said I, "you can probably give me some information about the old sailing ship days here."

"Yes," said he, "my own memory goes well back into sailing ship days and my father's memoirs and records are all of the times before steam and diesel had driven the sailing ship from the long trade routes. But, if we are going to talk sailing ship, come along up to the house. It's only a short walk and in my den I have some rather interesting prints and notes concerning those days."

The bark Alice Cameron of the Circular Saw Line made Auckland from San Francisco in 31 days

So we climbed the bluff back of the beach on a private path and were soon cosily discussing records and the merits and demerits of the wind-driven craft and their skippers.

The old gentleman called my attention to the New Zealand trade with California in the sixties of last century and showed me several copies of manifests and bills of lading. In there it was evident that whereas in 1850 these vessels carried full cargoes of agricultural products from Auckland to California and returned, mostly in ballast, by 1865 the conditions had practically reversed.

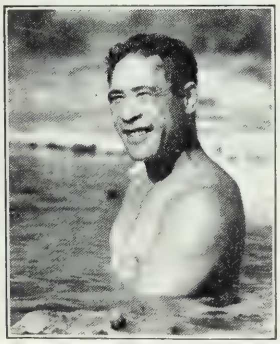
This led me to ask, "What is the best sailing record made by those ships on that route?" In answer, he handed me two or three clippings from old newspapers. Said I, "I would much prefer to have you tell it."

"Righto!" said he. "Here is a record made in 1867, when the favorite Circular Saw liner Alice Cameron, with Captain J. Nearing in charge, arrived at Auckland on the evening of March 7th, 31 days out from San Francisco, loaded with wheat, flour, oats and salmon, and with 3 passengers. She was two or three weeks ahead of expectation. She had been 58 days running from Auckland to San Francisco, and the elapsed time of her round trip was 105 days.

"On her passage south, Alice Cameron had fresh breezes to the Equator, where she was 'becalmed' for two days, and then had four days of light winds and calmy after which off the Great Barrier reef she found the NW trades and romped home in a day.

"Alice Cameron, a bark of 347 tons, was formerly the Siren Queen, an American whaler. She also was credited with another speedy voyage, a record run of 5 days, 4 hours from Sydney to Auckland. The steamer track distance on this one is 1278 miles so that this old hooker averaged 248 nautical miles or better than 10 knots.

"In 1875, Alice Cameron, in company with two other ships, Leslie M. Long and Jewess, all laden with coal, put out from Newcastle, Australia, for Manila. All three ships disappeared without trace."



A Beachcomber combing

Noticing that my host was getting sleepy, I thanked him and rose to go, but he said, "Wait a minute, man, I don't want you to go away thinking that this is the record run from California, as so many do. For the real record, you must go back to 1850 when the little bark, Novelty, 255 tons, Captain Harrison, arrived at Auckland in ballast on December 27th, having made the passage from San Francisco in 29 days. That I think still stands as the record.

Where long Pacific swells break on short beaches between rocky heads—there is the beachcomber's paradise

"We do not have the logs of these ships to show the distance sailed, and it is very probable that neither of them ever approached the daily or hourly record speeds of the great sailing clippers; but for small vessels, as they were, and not built for speed, these records are very creditable."

WORKING OFF FROM A LEE SHORE

We cull from "Sea Breezes" an interesting yarn of sailing ship days at Melbourne fifty years back as told by a former apprentice in the British-Australia Clipper Loch Sloy.

They had completed loading. They hauled out to the stream and anchored for the night. Then in the morning they "got under weigh and were towed down to Port-Phillip Heads, homeward bound for London River." Approaching the heads, they found a "strong southerly wind blowing and a heavy sea running outside. Pilot and captain had some hesitation about proceeding, but Miltiades (a famous clipper) had already towed out safely, so we carried on. Through the quarter mile of boiling, eddying 'rip' all went well until we reached the outer edge. Then as so often happens, two or three big rollers broke in and snap went the manila spring of our tow rope close to the counter of the tug."

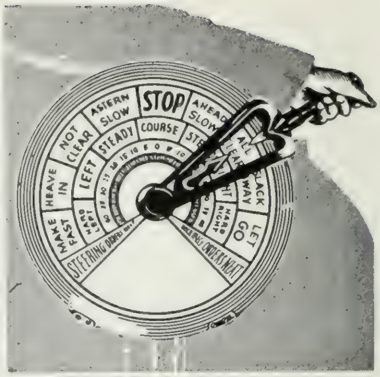
Previously sent aloft to stand by to loose the mizzen topsails, the young apprentice had an excellent and comparatively detached view of the proceedings that followed. Says he, "Panic is not the right word to describe the commotion about our decks, for every one knew that our chances of safety depended on getting sufficient canvas onto the ship in the next ten minutes. She was falling off to port and drifting broadside on toward the Nepean beach where a heavy surf was breaking on the jagged rocks.

"All orders were given with great promptness and decision. Never before or since have I seen British merchant seamen move with such celerity. The voice of our fine old chief mate would have galvanized an Egyptian mummy into vigorous activity.

"Topsails were sheeted home, fore and aft, canvas was run up, and slowly the good ship began to gather headway, and lessen her rate of drift. By this time we were uncomfortably close to the breakers. The tug, a decrepit old packet, veered and came down to us, but the captain evidently considered we were past his aid, for he sheered off and went his way. As more canvas caught the breeze the good ship increased her speed and headed up better, and it was soon evident that we were safe from immediate danger. The cutter ran down to us and we disembarked our pilot and were off on the homeward passage. After clearing Bass Straits, we saw no land till 100 days later when we raised one of the Western Isles and two weeks later were in London River."

Steady as you go!

KNOWLEDGE IS THE STRAIGHT COURSE TO ADVANCEMENT



A Department for Deck Officers

by "The Skipper"

Questions Welcomed. Just Address "The Skipper," Pacific Marine Review, 500 Sansome Street, San Francisco, California

All Hands on Deck

For some months this department has been down below stowing a very miscellaneous variety of shipments into holds and tween decks, and now we are coming up on deck for some fresh air and a chance to look over our gear. Recently we have received a number of questions about cargo handling gear, hemp and wire rope, and hawsers. We shall therefore attempt to answer some of these queries, and to do so in orderly fashion we will start with hemp rope, devoting one section to that subject, and in subsequent issues develop the entire scope of cargo handling, mooring and steering gear as future questions may lead us.

MANILA ROPE

I—GOOD PRACTICE—SAFE LOADS

ROPE—GENERAL AND DEFINITIVE

The word rope, in so far as this discussion is concerned, will be taken to designate any cordage with a circumference of one inch or more.

Rope size will always be given in inches of circumference.

Rope is made of vegetable fiber, and marine rope is usually made either of true or of false (Manila) hemp, or of cocoanut (coir) fiber.

Coir rope is of special advantage because of its ability to withstand salt water deterioration and abrasion. It is inferior in strength to hemp rope, and can be eliminated from the discussion of deck gear so far as American vessels are concerned.

Rope making is one of the most ancient industries. Allusions to it and pictures of it are found in the oldest inscriptions yet uncovered.

The arts of rope making and of rope use have built up a vocabulary all their own. A few samples are:

Strands—A group of threads or fibers twisted into a compact cord.

Lay—To put strands in place and twist them into a rope.

Hawser lay—Three strands laid up with a right-hand twist.

Shroud lay—Four strands laid up with a right-hand twist around a core strand.

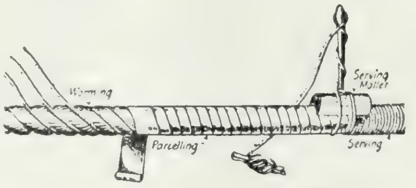
Cable lay—Three right-handed hawser-laid ropes laid up together with a left-hand twist.

Worming—Small yarns wound into the grooves between the strands so as to make the rope more perfectly round for parceling.

Parceling—Wrapping the rope with strips of tarred canvas.

Serving—Winding small cord or twine tightly round the rope. Generally over parceling.

Whipping—Winding small cord or thread round rope ends to prevent raveling.



Worming, Parcelling and Serving

Worm and parcel with the lay,
Turn and serve the other way.

QUESTION

Why is marine cordage usually called Manila rope?

ANSWER

Because the best fiber for rope-making is grown in the Philippine Islands and is shipped to the rope makers of the world through Manila. For many years the ropes used on naval vessels were made from Russian hemp fiber. The best of this material is as strong as the Manila fiber, but it is not as long nor does it wear as well for heavy duty in block and tackle work.

QUESTION

Is Manila fiber taken from hemp plants?

ANSWER

No. It is sometimes referred to as Manila hemp, but it is derived from the abaca plant, a species of wild banana.

The fibers of this plant are separated from the pulp by scraping, and are dried in the sun and baled for shipment. Fibers vary in length from six to twelve feet or more, and are graded according to color, strength, fineness and length. This fiber is now recommended by authorities for all applications where strength, durability and long service are desirable.

QUESTION

How can I know that a rope is made from Manila fibers?

ANSWER

Many attempts have been made to grow abaca in other countries under similar soil and climatic conditions, but so far without commercial success. A good new Manila rope has a hard feel, but is pliant. Its color is gray with a yellow or green tinge and a silver or pearl luster.

The U. S. Bureau of Standards has a definite chemical test. A small sample of new rope is separated into strands and the oil rinsed out of a strand with ether or alcohol. This strand is then immersed for thirty seconds in a bleaching powder solution acidified with acetic acid. Finally the strand is rinsed first in water and then in alcohol. If a strand so treated is exposed to ammonia fumes and turns a russet brown, it is Manila abaca fiber. All other fibers used in ropes turn a cherry red.

QUESTION

Is there any way to detect inferior grade Manila rope?

ANSWER

Yes, color is usually the key to this answer.

Brown spots in a new rope indicate that the fiber was not properly cured, and the rope will be weak and soft wherever these occur.

A very dark or black section indicates that the fibers had fermented during the curing process and are of inferior grade. Where there is any doubt about a coil of new rope, it should be examined carefully throughout its length.

QUESTION

What is a safe load for Manila rope?

ANSWER

The table reproduced herewith gives safe working loads for various sizes of Manila rope. If you do not have the figures handy, here is a very simple rule that will give you very roughly the ultimate strength for Manila rope under ordinary working conditions:

$$S=\frac{C^2}{3},$$

where S is the ultimate strength in tons and C is the circumference of the rope in inches.

A rough rule of a similar kind for the safe load of Manila rope in working at medium speed continuously over ordinary sheave blocks is $L=\frac{C^2}{60}$, where L is the safe load in tons and C is circumference in inches. Note that according to this formula the strength of the rope increases as the square of the size.

Working this out for three-inch rope, we get:

$$L=\frac{C^2}{60}=\frac{9}{60}=\frac{3}{20}\text{ tons}=300\text{ lbs.}$$

$$S=\frac{9}{3}=3\text{ tons}=6000\text{ lbs.}$$

This indicates a factor of safety of approximately 20 between the breaking load and the safe load. This large factor of safety is necessary because: Vegetable fibers twisted into rope do not make an absolutely uniform product; the strain on the fibers in a rope is largely increased in bending over sheaves in blocks and fair leaders; and the effect of the load is increased when lifting with the rope at an angle, as is often necessary.

QUESTION

What is the best way to keep Manila rope from deteriorating?

ANSWER

Manila rope, like all vegetable fiber, is subject to deterioration caused by moisture. Ropes should never be coiled tightly and stored in a wet condition, but should either be coiled loosely on a grating or flaked on a boom until they are thoroughly aired and dry before storing away. Rope lockers should have sparred shelving, so that air can get all through the coils. All ropes should be brought on deck occasionally and sunned and dried, because particles of salt in the rope will draw moisture and cause dry rot.

All rope stowed on deck should be well covered with tarpaulins to protect it against grit and cinders from the funnel. This type of material will cut the fibers when passing round drums or sheaves under strain.

SEVEN SAFE RULES

Rope should be:

Stored in a dry place.

Hung on hooks or rods.

Coiled on gratings.

Kept away from acid or strong alkali.

Kept free from kinks.

Thawed carefully and slowly when frozen.

Kept as clean as practicable.

All rope is treated with oil in the process of manufacture. This oil acts as a preservative and as an internal lubri-

SAFE LOADS OF ROPE

Cir. of rope in inches	Working load in pounds			Minimum diameter of sheaves in inches		
	Rapid	Medium	Slow	Rapid	Medium	Slow
1⅛	25	50	120	15	5	3
1½	50	100	250	20	6	4
2	70	140	360	25	8	5
2¼	105	210	520	30	9	6
2¾	125	250	620	35	10	7
3	150	300	750	40	12	8
3½	200	400	1000	45	13	9
3¾	240	480	1200	50	15	10
4½	320	640	1600	60	18	12
5½	420	840	2100	70	21	14
6	560	1020	2800	80	24	16
7½	800	1600	4000	100	30	20
10½	1200	2400	6000	120	36	24

NOTE: In this table the work required of the rope is, for convenience, divided in three classes, "rapid," "medium" and "slow," these terms being used in the following sense: "rapid"—400 to 800 feet per minute; "medium"—wharf and cargo hoisting, 150 to 300 feet per minute; "slow"—derrick, crane and quarry work. In compiling the data given in the above table information contained in a similar table in Kent's "Mechanical Engineer's Handbook" and the National Founders' Association table of safe loads for ropes and chains has been used.

cant. From 8 to 12 per cent of the weight of new rope is lubricant.

There are available especially-prepared materials that penetrate to the inner fibers and act as preservatives as well as lubricants. New ropes should be treated, and the treatment renewed at regular intervals, especially on ropes that are used for hoisting or hauling.

QUESTION

How does a Manila rope indicate that it is weakened?

ANSWER

In general, any rope which has lost its "stretch," or in which the fibers have lost their luster, should be suspected. All rope should be examined thoroughly from time to time. Abrasion and broken fibers on the outside of rope are easily detected. Look for spots black to rusty brown in color. At such spots throw the twist out of the rope and examine inside fibers. Fibers damaged by acid will usually crumble in twisting between thumb and finger.

Rope under inspection should be untwisted at intervals to locate any internal wear, abrasion or broken fiber. Test a piece of the yarn by breaking it with the hands. If it breaks with a very small effort, the rope is unsafe and should be discarded.

It is far better to replace the rope than to use it if its strength is doubtful.

QUESTION

What are the best block sizes to use with Manila rope?

Deck Officers' Licenses for February

Name and Grade	Class	Condition
JUNEAU		
E. P. Brastad, Chief	SS & MS, any GT	RG
SEATTLE		
J. L. Sloan, Master	SS, any GT	RG
J. H. Christensen, 2nd Mate	SS, any GT	RG
R. P. Dowling, 2nd Mate	SS, any GT	RG
W. M. Shelton, 2nd Mate	SS, any GT	RG
K. L. Simundson, 3d Mate	SS, any GT	O
SAN FRANCISCO		
G. H. Craig, Master	SS & MS, any GT	RG
H. K. G. A. Hansen, Chief	SS, any GT	RG
G. E. Phebus, Chief	SS, any GT	RG
R. C. Russell, Chief	SS, any GT	RG
R. L. Shull, Chief	SS, any GT	RG
W. O. Yardley, Chief	SS, any GT	RG
J. A. Zinn III, Chief	SS, any GT	RG
R. H. Dean, 2nd Mate	SS, any GT	O
C. D. Hammel, 2nd Mate	SS, any GT	RG
C. M. Perkins, 2nd Mate	SS, any GT	RG
C. A. Thau, 2nd Mate	SS, any GT	RG
J. Arbios, 3d Mate	SS, any GT	O
O. A. Larson, 3d Mate	SS, any GT	O

Abbreviations: SS is steamship; MS is motorship; GT is gross tonnage; O is original license; RG is raise of grade. All of these licenses are for ocean service.

ANSWER

The minimum diameters of block sheaves for various working conditions with Manila rope under safe loads are given in the table herewith. Remember that minimum sizes are given because any smaller diameter of sheave would put an undue strain on the rope and thereby reduce the safe working load. So far as the safety of the rope is concerned, the larger the sheave the better.

It is important that there be ample clearance for the rope between the cheeks of the block and between the sheave and the end of the shell. The rope should have ample space to pass through, otherwise greatly increased friction and severe abrasion will result.

An Important Order on the Scope of Ship Radio Service

This year there is considerable movement among various Federal regulatory bodies to curb irresponsible use of communication services. With ship radio operators the rules have been made more rigid and are going to be strictly enforced. The following letter is practically an order **To: Ship Radio Operators, Ship Station Licensees and Others Concerned.**

The Federal Communications Commission, by circulars dated June 8, 1940, June 10, 1940, and June 14, 1940, cautioned all U. S. ship radio operators and ship station licensees concerning the transmission of superfluous, unnecessary or unidentified communications from ship stations to other ship stations or to shore stations. Regardless of this admonition certain individuals continue to disregard the provisions of Section 303 (m) (1) (D) of the Communications Act of 1934, as amended, and Article 22, paragraph 1 (1) of the General Radio Regulations (Cairo Revision, 1938) annexed to the International Telecommunications Convention (Madrid, 1932), both of which specifically forbid such transmissions.

The Commission has also observed that various small fishing vessels, on leaving the fishing grounds, which are often a considerable distance at sea, collect by radio, messages of a personal nature for distribution on shore, from the vessels remaining on the fishing grounds. Conversely, messages of a similar nature are in many instances collected on shore and upon arrival of the vessel at the fishing grounds, are transmitted by radio apparently without charge to the persons concerned aboard the various ships which remained at sea. This procedure has resulted in additional congestion being caused on the frequencies utilized for ship service.

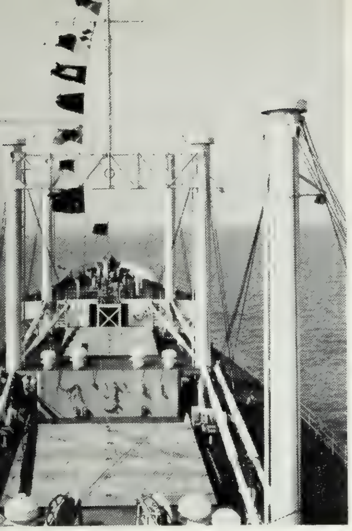
Section 8.35 (a) (Scope of Ship Service, which became effective March 1, 1941) of the Rules Governing Ship Service, which is quoted in part for the future guidance of all concerned, does not permit the method employed in the collection and dissemination of the communications in question:

> "Section 8.35 (a) In addition to signals, communications and messages relating to the safety of life and property at sea and the safety of navigation, a ship station shall, within the scope of its normal operations, without discrimination and *upon reasonable demand,* transmit any messages which **originate with passengers or members of the crew on board* that relate solely to the personal or business affairs of those on board or to the business of the particular ship as a medium of transportation or as a carrier of passengers of goods."

The Commission feels that the scope of permissible communications in the ship service has been publicized to the extent that it is reasonable to expect knowledge of and full compliance with the law by all operators and licensees concerned. Therefore, all classes of ship radio operators and ship station licensees, which includes radiotelephone as well as radiotelegraph, are hereby advised that rigid monitoring procedure has been adopted and any violators observed in this respect may expect the Commission to impose the forfeitures and penalties provided by law.

Signed T. J. SLOWIE, *Secretary,*
Federal Communications Comm.

*Italics added.



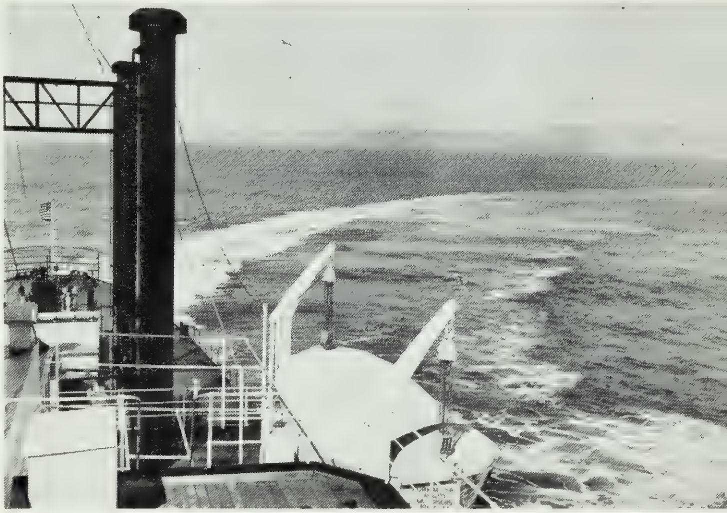
Mormacsea Delivered

Third C-3 from Moore's Yard Passes All Tests with Flying Colors

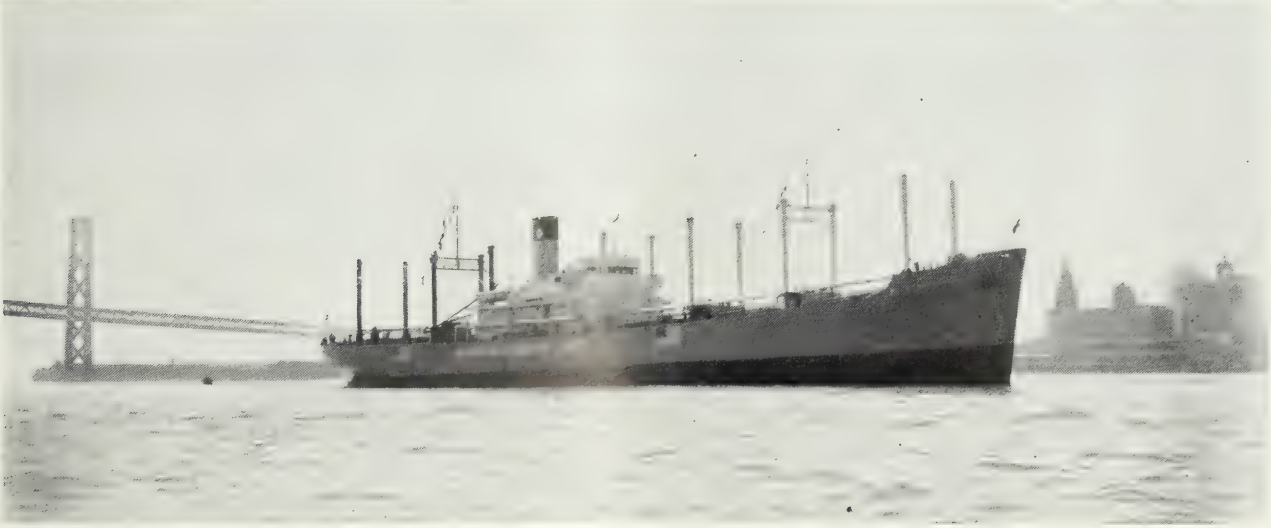
Third of a series of four C-3 type steamers, built at the Oakland yard of the Moore Dry Dock Company for the U. S. Maritime Commission, the cargo-passenger liner Mormacsea was put through extensive sea trials March 10 to 12. This fine steamer passed all requirements with ample margin and was accepted by the Commission and by the Moore-McCormack Lines, Inc., who are buying her from that federal agency.

The first of the quartet of C-3s building at Moore's was christened Sea Arrow. Immediately following her trials, she was acquired by the U. S. Navy and returned to her builder's yard for extensive alterations, converting her into a seaplane tender. She was rechristened Tangier. The second ship, christened Sea Star, was purchased by the Moore-McCormack Lines. Her name changed to Mormacstar, she is now in operation on their Pacific Coast-South American run.

S.S. Mormacsea is now operating in that service and S.S. Mormacsun, which will be delivered shortly, is to be utilized on the same route.



Mormacsea maneuvers beautifully turning in a graceful circle, as shown above



Moore-McCormack cargo liner Mormacsea on her preliminary trials on San Francisco Bay, San Francisco skyline on right, San Francisco-Oakland Bay bridge on left

At right:

Top: This handsome gentleman adjusts the Fathometer

Center: American Engineering Co. windlass and Naco anchor chain

Bottom: Radiomarine Corporation apparatus in the wireless operator's room

These four ships are all identical with the exception of a considerable volume of refrigerator space added to the three Moore-McCormack ships. The first vessel of the four was described with great detail in the July, 1940, issue of PACIFIC MARINE REVIEW.

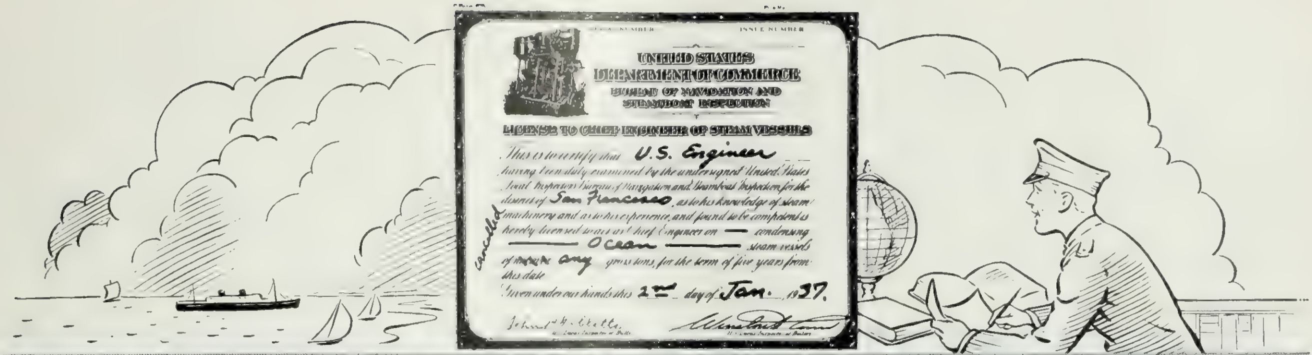
The power plant comprises two type "D" Foster-Wheeler marine water-tube steam generators, which have a capacity to supply 112,500 pph of steam at 440 psi and 740° F. throttle, to a cross compound DeLaval double reduction geared marine type steam turbine with a normal full load rating of 8500 shp delivered to the propeller shaft at 85 rpm when exhausting into 28½ inches vacuum.

Each of the above steam generators is capable of supplying steam for normal full load operation. The turbine is capable of continuous 10% overload and of 25% overload for two hours. The specified sustained sea speed is 16½ knots. The top speed on trial was over 19 knots.

On trials these vessels exceeded all requirements and made better than guaranteed fuel economy, thereby qualifying the builders to a nice bonus. Since these power plants were the first high pressure commercial marine propulsion units installed by a Pacific Coast shipbuilder, it is a matter for hearty congratulation to Joe Moore and his very efficient organization that, on all three of these officials trials, the entire machinery installation has functioned with high efficiency and with record economy.

Mormacsea and her sister ships each have six fine staterooms with private baths, providing de luxe accommodations for twelve passengers.

This group admiring the Sperry Gyro pilot includes: Jos. Moore, chairman of the board of the Moore Dry Dock Co.; Commander K. H. Donavin, Pacific Coast manager of Moore-McCormack Lines; the late Capt. W. T. F. George; and T. W. Massenburg in charge of trial for the U. S. Maritime Commission



UNITED STATES
DEPARTMENT OF COMMERCE
BUREAU OF NAVIGATION AND
STEAMBOAT INSPECTION

LICENSE TO CHIEF ENGINEER OF STEAM VESSELS

This is to certify that U.S. Engineer having been duly examined by the undersigned United States Local Inspectors Bureau of Navigation and Steamboat Inspection for the district of San Francisco, as to his knowledge of steam machinery and as to his experience, and found to be competent is hereby licensed to act as Chief Engineer on — condensing — Ocean — steam vessels of any gross tons, for the term of five years from this date.

Given under our hands this 2nd day of Jan. 1937.

Cancelled

Your Problems Answered

by "The Chief"

"The Chief's" department welcomes questions—Just write "The Chief," Pacific Marine Review, 500 Sansome Street, San Francisco, California

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MARINE BOILERS

XIII—SUPERHEAT

QUESTION

What is the basic meaning of superheated steam or any other superheated gas?

ANSWER

Many substances exist as a solid, liquid or gas, depending only on temperature and pressure, with increasing pressure causing an increase of temperature of the gaseous state. (This general subject will be discussed more completely in subsequent articles on "Thermodynamics.")

The pressure-temperature combination which causes a liquid to vaporize is called the boiling point. The liquid also condenses at this same combination of conditions and whether it boils or condenses depends on whether heat as heat is entering the system or being withdrawn.

It is obvious that if both liquid and gas or vapor of the liquid are present in an enclosed space, it is impossible to add heat and raise the temperature (at a constant or fixed pressure), as either the pressure will rise or if kept constantly bled off, the boiling effect will remove the heat as fast as it is added. It is also impossible, under similar conditions, to remove heat or cool the liquid or gas, as the pressure will fall, or if maintained by reducing volume of gas by compression the gas will condense into a liquid replacing the heat withdrawn.

Thus at the boiling point no other temperature is possible than that corresponding to the pressure. These values have all been accurately established by careful laboratory work and tabulated for most gases and liquids. A vast amount of work has been done on steam, and published. These data are called "Steam Tables," copies of which should be in every engineer's desk.

The temperature of a gas may, however, be raised above this so-called boiling point provided the gas is first removed from the presence of its liquid. Thus the process of leading steam off from its steam drum, then returning it to the fire for more heat and increased temperature, is called superheating. If any drops of entrained moisture are in the steam, these must be evaporated before the superheating process may commence. Thus superheated steam is dry steam, a very nearly perfect gas, invisible and colorless unless heated to over 700° F. at which point it may show a glow due to temperature only.

QUESTION

What, precisely, are the merits of superheated steam?

ANSWER

Basically the reason underlying the use of superheat is to increase the recovery of energy in the fuel. The efficiency of this recovery for all types of heat engines, internal combustion, hot air, reciprocating steam or steam turbine is expressed by the formula $\frac{T_1-T_2}{T_1}$, where T_1 is the temperature in degrees absolute Fahrenheit at which the medium of expansion is withdrawn from the fire and taken to the engine, and T_2 is the temperature degrees Fahrenheit absolute at which it leaves the engine as an exhaust. When we recall that the zero on the absolute Fahrenheit scale is at 460° below zero on the common F. scale, or 492° F. below the freezing point of water, we can see how low the efficiency of energy recovery from the fuel is. In steam plants 15 to 25 per cent is usual. Thirty per cent has been obtained in shore steam plants and is the goal of modern marine plants with super pressures and temperatures. Diesel engines using all possible heat saving devices may go as high as 40 per cent on this ratio as they start to remove the energy from the gas at a very high temperature. The steam turbine plant is limited in temperature by the blading metals available for these high temperatures.

QUESTION

Will engine efficiency be increased by increase of steam temperature alone, not increasing pressure?

ANSWER

The higher the temperature of the steam leaving the boiler, the better the energy recovery ratio. But due to the nature of steam, which is not exactly suited for the ideal temperatures and pressures we would like to use, if we superheat it to 800° F. but at a low pressure, say 250 lbs. gage, then the engine will use all available expansion and will exhaust at the vacuum with remaining superheat, and we will lose availability at the condenser, by cooling superheated exhaust steam. Thus we must raise our initial pressure when we raise our initial temperature.

QUESTION

Will pressure alone improve engine efficiency?

ANSWER

No. If we raise temperature by raising pressure but do not superheat, then we will be exhausting steam which has too much moisture in it. We will lose most of our gain by turbine losses due to the high percentage of moisture in the lower stages which wets the buckets, causes "steam drag" and produces other turbine losses.

QUESTION

What determines the relation of pressure and temperature as both are increased for optimum condition?

ANSWER

In general it may be stated that the attempt to increase recovery of energy by raising temperature must be limited to raising both total temperature and pressure so that the exhaust will not be superheated at all, and will have not more than 7 to 15 per cent moisture content. The exhaust conditions determine the limits of the initial conditions of the steam. This explains why the super modern plants we read about are going up on both pressure and temperature.

QUESTION

What are the special considerations in superheater surface?

ANSWER

Like the water tubes in the boiler, the superheater is a heat transfer surface. However, there are several vital differences.

First, the heat added to the steam by the superheater will be only a small amount relative to the heat added by the water tubes, approximately one quarter. To illustrate, assume 480 lbs. per square inch absolute and 740° F. total temperature, a superheat from 463° F. to 740° F. or 277° F. Also that the boiler tubes only supply the heat of vaporization, in this case 759 Btu per pound. The superheater will raise the total heat of the steam from 1204 to 1381 Btu per pound, an increase of 177.

Thus for each pound of steam the superheater added 177 Btu and the water tubes added 759 Btu.

Secondly, the high velocity of the steam through the superheater tubes, which is permissible, allows of a tremendous increase in the pick-up of heat from the surface of the tube. It will be recalled that the higher the velocity of a gas over a metal, the higher the heat exchange. It is possible to remove heat from the inner wall of the superheater tube so fast that delivery of heat to the outer wall becomes the limiting factor. Increase in heat pick-up is accomplished in two ways: (a) a cast iron dummy core may be put into a very large tube, low and moderate pressures, to decrease sectional area of tube, thus increase velocity over the enlarged heat transfer surface; (b) use of smaller tubes, banked in parallel for moderate and high pressures, and to place a series of cast steel ring sections or collars over the tube, making good thermal contact with the outside of the tube wall and at the same time exposing two or three times the heat transfer surface to the hot gases or radiant heat of the fire.

Engineers' Licenses for February

Name and Grade	Class	Condition
JUNEAU		
W. W. Anderson, Chief	SS, any GT	RG
PORTLAND		
F. C. West, 1st Asst.	SS, any GT	RG
SEATTLE		
W. E. George, Chief	MS, any GT	O
C. S. Myers, Chief	MS, any GT	O
J. L. Reece, Chief	MS, any GT	O
SAN FRANCISCO		
C. R. Kidder, Chief	SS, any GT	O
S. A. H. Bylander, Chief	SS, any GT	RG
W. A. Ricketts, Chief	SS, any GT	RG
C. A. Rose, Chief	SS, any GT	RG
B. M. Egan, 1st Asst.	SS, any GT	RG
J. A. Katsos, 1st Asst.	SS, any GT	RG
P. S. Morgan, 1st Asst.	SS, any GT	RG
J. U. O'Brien, 1st Asst.	SS, any GT	RG
W. J. Paz, 1st Asst.	SS, any GT	RG
A. L. Pitts, 1st Asst.	SS, any GT	RG
J. G. Cadigan, 2nd Asst.	SS, any GT	O
H. Flathmann, 2nd Asst.	SS, any GT	O
R. A. Ross, 2nd Asst.	SS, any GT	O
E. L. Barton, 3d Asst.	SS, any GT	O
J. Hargas, 3d Asst.	SS, any GT	O
M. K. Seward, 3d Asst.	SS, any GT	O
R. J. Buda, Chief	MS, any GT	O
R. F. Ingersoll, Chief	MS, any GT	O
P. H. Monsaas, Chief	MS, any GT	O
L. M. Sullivan, Chief	MS, any GT	O

Abbreviations: SS is steamship; MS is motorship; GT is gross tonnage; O is original license; RG is raise of grade. All of these licenses are for ocean service.

QUESTION

What is the most difficult problem in connection with superheater location?

ANSWER

The most serious difficulty comes about from the fact that if located in too hot a spot, the tubes will burn out when steam is not flowing or is flowing at reduced loads. If in too cool a spot, the temperature will not be maintained at full and overloads.

Regardless of load, the temperature of the flame is the same approximately, but at light load the temperature of the last gas pass before the breeching is very cool and at overload is very hot. The variation of gas temperature in the later passes makes it undesirable to locate superheater surface there. It is possible for the steam to deliver heat back to the stack gases in this case.

On the other hand, the superheater surface could be reduced and placed next to the fire, so that at normal or overload the steam temperature was right, but then at light load the flame would be too hot for the reduced steam flow, and we would overheat the steam and tubes.

Overheated steam damages piping, valves, engines and turbines as well as the superheater.

For modern steam conditions, the usual compromise location is to locate the superheater tubes in the second gas pass, or behind the first layer of water-tubes, so that it gets quite a large part of its heat from radiation from the fire, through the spaces between water tubes, and at the same time gets quite high temperature gas also. Even the best combination will not give a uniform temperature of superheat at all loads, and there is really nothing the engineer can do about it. It is possible to admit a little feed water into the outlet of the superheater to cool the steam to a normal superheat. Some installations have attempted to so locate the superheater so that a damper would deflect more or less hot gas over the tubes, thus regulating the superheat. Any such methods, while working all right, do not make the best or most economical use of the heating surface in the boiler.

QUESTION

What is the best way to accurately control superheat?

ANSWER

The separately fired superheater is, of course, the most logical answer to control of steam temperature. One burner controlled from a thermostat in the steam out connection is adequate for most boilers. While possible to make the furnace for separate fired superheating part of the main furnace, still it occupies considerably more space than otherwise. When the superheater goes up into the 750° F. and 800° F. range, its temperature control is vital and may warrant the additional space. There are many such marine installations. Shore plants are up to 900° F. and 950° F. now.

The separately fired superheater, with common furnace with the boiler, or with its separate furnace, is especially suited where a large steam flow is desired at saturated temperatures, thus not requiring desuperheaters.

QUESTION

How is saturated steam supplied to auxiliaries from a superheater?

ANSWER

With the use of the conventional superheater, it is not permissible to take saturated steam from the drum before the superheater, as reducing steam flow to the latter without reduction in fire will cause excessive temperatures. There are marine uses for steam at the saturated temperature, and it thus becomes necessary to desuperheat.

The simplest and most stable desuperheater is a system of tubes located in the boiler drum below the low water line, and into which superheated steam is led. The water cools the steam down to the saturated temperature, regardless of the steam flow up to the limit of the heat transfer surface. No regulation or automatic controls are needed.

A spray of feed water will desuperheat, but it is difficult to control the exact amount required, and a very small amount over causes water in the steam. Rapidly varying steam loads render control unstable.

QUESTION

What is the effect of priming on a superheater boiler?

ANSWER

Superheated steam is dry and hot. 750° F. might be likened in temperature to the blast from the top of the flame of a gasoline blow torch. If any water from the drum carries over due to priming, it will entrain soluble and insoluble foreign matter, treating chemicals and organic matter which appears as a dust in the superheater. At this temperature some of it is sticky and coats the walls of the superheater, the piping, but particularly the turbine blades, building up a deposit. This may be washed off by running on wet steam a few minutes, but until it is removed, will materially reduce the maximum hp output and efficiency.

Our next article will discuss economizers, air preheaters and boiler auxiliaries.

Book Reviews

Laws Governing Marine Inspection, a 198-page book in paper cover, compiled for the Bureau of Marine Inspection and Navigation, by Frederick K. Artz, L.L.B., and printed by the Government Printing Office of Washington, D. C.

This publication contains all the unrepealed provisions of Title 52, Revised Statutes (R. S. 4399-4500) and Acts of Congress enacted subsequent thereto pertaining to marine inspection up to January 1, 1941, the date of publication. On the reverse side of its title page it carries:

Notice to Masters of Passenger Steam Vessels

"The attention of Masters, agents and owners of passenger steamers is directed to the requirements of Sect. 4494, Revised Statutes of the United States, which is as follows: 'Sect. 4494. Every master or commander of any steam vessel carrying passengers will keep on board such vessel at least two copies of the provisions of Title 52, to be furnished to him by the Secretary of Commerce, and if the master or commander neglects or refuses to do so, or shall unreasonably refuse to exhibit a copy of the same to any passenger who asks for it, he shall be liable to a penalty of twenty dollars'."

The general rule and regulations in Rule 5 provides that "every Master, Mate, pilot or engineer, when receiving an original license, a renewed license or a raise in grade of license shall be furnished by the Inspectors with a copy of the Laws Governing Marine Inspection and a copy of the General Rules and Regulations."

Golden Gate, by Felix Riesenberg, Jr. A handsome volume in red and gold cloth, illustrated with 27 fine halftones. Published by Alfred A. Knopf. $3.50 net. This book is subtitled the story of San Francisco Harbor. It is more than that. The story of the harbor is made rather incidental in an appraisal of the effect of shipping on the life and destiny of the city.

Interest in the theme is sustained throughout by a sure dramatic touch and by choice of personalities to emphasize the trend in each period of the city's history.

We have seen no better book than this for getting, in one short volume of intensely interesting narrative, the feel of the glamorous spirit energizing the city that sits by the Western Gate, still apparently as "serene" and as "indifferent to fate" as she was in the days of Bret Harte, of Robert Louis Stevenson or of Jack London.

On the Ways -

SHIPS IN THE MAKING

LATEST NEWS FROM AMERICAN SHIPYARDS

Six New Shipyards

Rapid progress is being made in the establishment of six new shipyards and expansion of an existing yard for the construction of 200 10,000-ton emergency ships.

The seven yards have purchased equipment of a total value of about $8,000,000 and have begun to install shipways, outfitting docks, cranes, furnaces, locomotives, welding machines, machine shops, plate shops, and administration buildings.

The Bethlehem-Fairfield Shipyard, Inc., Baltimore, Md., has signed contracts for major construction work for its 13-way yard amounting to over $3,000,000 and has placed orders for approximately $2,000,000 worth of equipment.

The North Carolina Shipbuilding Company, Wilmington, N. C., has placed a contract for general construction work in connection with its 6-way yard, amounting to over $900,000, and broke ground in connection with its construction program on February 3. It has placed orders for tools and equipment amounting to about $2,000,000 and expects to start shipbuilding operations in the new yard on May 1. Completion of the yard by August 1, 1941, is anticipated.

The plant layout for the four new ways and other facilities to be installed at Mobile, Alabama, by the **Alabama Dry Dock and Shipbuilding Company** has been approved by the Commission.

The Houston Shipbuilding Corporation, Houston, Texas, is actively engaged in the preparation of the site for

Record Value in Shipbuilding

Based on figures for January 1, 1941, American shipyards, including navy yards, hold contracts aggregating approximately $4,749,000,000. This is the largest dollar value of ship construction in the nation's history.

Private shipyards on that date held contracts for 543 vessels with an aggregate cost value of $3,759,000,000. Navy yards had on order 100 vessels with a value of $990,000,000.

SEAGOING STEEL MERCHANT VESSELS OVER 2,000 GROSS TONS EACH
COMPLETED IN 1941 UP TO MARCH 1st.

Type	No.	Gross Tons	Steam		Diesel		Turbo-Electric	
			No.	H.P.	No.	H.P.	No.	H.P.
Cargo	5	34,925	5	26,950	—	—	—	—
Tanker	1	11,237	-	- -	1	7,500	—	—
Passenger	1	9,255	1	9,350	—	—	—	—
Totals	7	55,417	6	36,300	1	7,500	—	—

COMPLETED IN FEBRUARY, 1941
AND INCLUDED IN ABOVE TOTALS FOR YEAR TO DATE

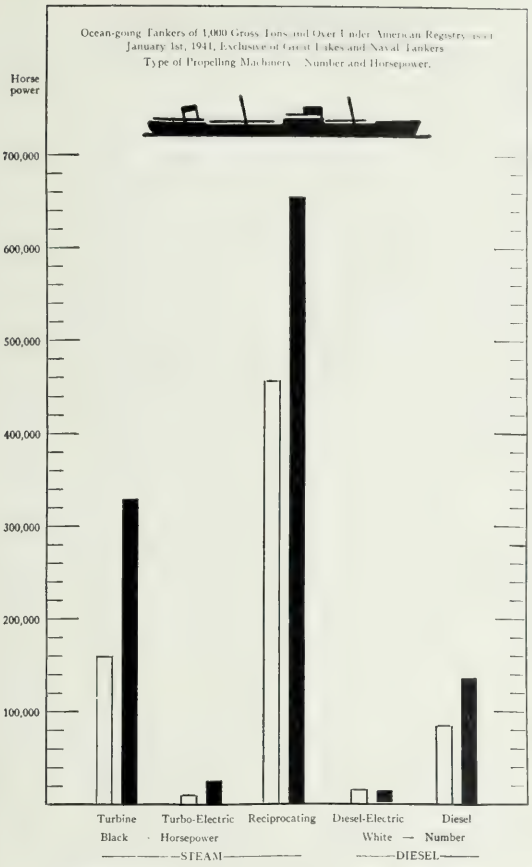
Name	Type	Gross Tons	Horsepower		Owner	Builder
			Steam	Diesel		
President Hayes	Pass.-Cargo	9,255	9,350	-	American President Lines	Newport News S.B. & D.D. Co.
Alcoa Pathfinder	Cargo	6,797	4,400	–	Alcoa S.S. Co.	Bethlehem Steel Co., Staten Is., N.Y.
Cape San Martin	Cargo	6,759	4,400	—	Maritime Commission	Bethlehem Steel Co., San Francisco, Cal.
Mormacyork	Cargo	7,796	9,350	—	Moore-McCormack Lines	Federal S.B. & D.D. Co.
Totals	4	30,607	27,500	—		
Completed in February 1940	2	14,831	15,400	—		

LAUNCHINGS IN MONTH OF FEBRUARY, 1941

VESSELS OVER 2,000 GROSS TONS EACH

Name	Date	Type	Gross Tons*	Horsepower*		Owner	Builder
				Steam	Diesel		
Esso Williamsburg	2-8	Tanker	11,400	—	7,500	Standard Oil Co. of N.J.	Sun S.B. & D.D. Co.
Marina	2-12	Cargo	5,900	4,000		Maritime Commission	Pusey & Jones Corp.
Hawaiian Planter	2-15	Cargo	8,900	8,500	-	Matson Navigation Co.	Newport News S.B. & D.D. Co.
Totals		3	26,200	12,500	7,500		
Launchings February 1940		2	16,073	17,950	—		

* Estimated



Graph shows power, number and machinery type of American tanker fleet

Courtesy of American Bureau of Shipping

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its 6-way yard at Irish Bend Island, based on plans which have been approved by the Commission. It has placed orders amounting to about $700,000.

The California Shipbuilding Corporation at Los Angeles broke ground January 27 and has approximately 15 per cent of the 8-way yard facilities completed. It has ordered machinery and equipment totaling approximately $2,500,000. Bechtel-McCone-Parsons Corp. has a contract to construct the facilities.

The Oregon Shipbuilding Corporation at Portland, Oregon, broke ground on its construction program February 4, 1941. About 12 per cent of the construction for its 8-way yard has been completed and machinery and equipment totaling about $1,500,000 has been ordered.

For the 6-way New Orleans yard, **Louisiana Shipyards, Inc.,** has retained the J. G. White Engineering Corporation of New York to design and construct the plant facilities. Fabrication of the vessels will be done by the **Delta Shipbuilding Company,** a Louisiana subsidiary of the **American Shipbuilding Corporation** of Cleveland, Ohio.

Murals for Rio Class C-3-P Liners

The Maritime Commission is holding a competition among American artists for a series of mural and sculptural decorations for four C-3 type passenger and cargo vessels being built at the **Sun Shipbuilding and Dry Dock Co.** yard at Chester, Pennsylvania.

The murals and sculptures are to be inspired by subjects or themes of South American life, history, customs or geography and Pan-American and Good Neighbor policies. The four vessels will be operated by the Moore-McCormack American Republics Line from New York to the East Coast of South America.

Names of the vessels are: **Rio Hudson, Rio Parana, Rio de Laplata** and **Rio de Janeiro.** They will have accommodations for 217 passengers each. Interior decorations have been designed in a contemporary manner with an underlying theme of South American spirit.

Each ship will have a mural panel approximately 6′ x 6′6″ located in the lounge. The sculpture in each vessel will be approximately 1′9″ wide, 2′6″ high and 9″ deep and will be located in the second deck stair hall on each vessel.

The competition winners for the mural will receive $1,120. Competition winners for the sculpture will receive $400. Designs will be judged by a jury selected by the Commission to represent the Commission and the proposed operating line.

Electro Dynamic Motors on C-1 Ships

In our February issue there was published an illustrated description of the C-1 cargo steamers built at the Federal Shipbuilding and Dry Dock Company's yard, Kearny, New Jersey, for

Above: Mrs. E. H. Blum breaks champagne bottle across nose of the all welded hull and christens it with the name of her husband

Below: Turbo electric drive tanker E. H. Blum glides her graceful length gently into the waters of Delaware River

the Lykes Brothers Co., Inc., of New Orleans. This description inadvertently omitted the name of the maker of the electric motor drives for auxiliary machinery.

We are glad here to emphasize the fact that the Electro Dynamic Works furnished for these vessels the following motors:

Application	*Quantity per Ship*	*Horsepower*
Cargo winch	16	45
Windlass	1	60
Capstan	1	35
Steering gear	2	35
Main circulating	1	50
Auxiliary circulating	1	15
Fire and Butterworth	1	50
Bilge	1	15
Ballast	1	15
Main condensate	2	10
Auxiliary condensate	1	5
Lubricating oil	1	10
Fuel oil service	1	5
Fuel oil transfer	1	10
Cargo pumps	1	5
Main feed	2	20
Sanitary	1	3
Drinking water	2	¾
Ship's service air compressor	1	20
Emergency air compressor	1	2
Refrigerating compressor	1	5
Forced draft blowers	2	25
Turning gear	1	5
Emergency generator	1	10 kw

The control equipment manufactured by Cutler-Hammer, Inc., was furnished by Electro Dynamic Works for the above applications.

New Atlantic Tanker Launched at Sun Yards

The Atlantic Refining Company added another large tanker to its fleet on March 15 as the S. S. E. H. Blum, a 19,400-ton oil carrier, was launched at the yards at the Sun Shipbuilding and Dry Dock Company in Chester, Pa.

The vessel was named in honor of E. H. Blum of Dallas, Texas, formerly of Philadelphia, who is vice president of Atlantic in charge of domestic oil production. Mrs. Blum christened the big tanker as she shattered a traditional bottle of champagne on the vessel's bow.

The newest Atlantic tanker will be commissioned April 1. It will bring the Atlantic fleet to a total of 24 vessels, which are operated in crude oil transportation service between Texas Gulf ports and Philadelphia, and in service between refineries at Philadelphia and Atreco, Texas, and domestic and foreign bulk distribution terminals.

E. H. Blum is a sister ship of Robert C. Tuttle, which went into service last year, and is similar in design to three other large tankers, the S. S. J. W. Van Dyke, Robert H. Colley and E. J. Henry, which were commissioned in 1938 and 1939. The vessels are the largest all-welded tankers in the world —a design in which Atlantic pioneered.

E. H. Blum has cargo capacity of 154,000 barrels carried in 27 tanks, including nine center tanks and nine wing tanks on either side. Cargo discharge pumps are capable of unloading the vessel in approximately nine hours.

The new vessel can maintain a sea speed of 13.25 knots. Her turbo-electric engines develop 5,000 horsepower. The steam generating system operates at 625 pounds pressure and 920 degrees Fahrenheit, the highest steam pressure and temperature operation in the American merchant marine.

Federal Gets 8 More C-2's

The Maritime Commission announced on February 12 clearance with the National Defense Advisory Commission of an award of contract to the Federal Shipbuilding and Dry Dock Company, Kearny, New Jersey, for construction of eight C-2 type, steam - propelled cargo ships. The award was made on the company's adjusted price bid of $2,765,000 each, submitted January 6.

The award brings the total number of C-2 type cargo vessels built or building to 58.

The number of ships built or building in the Commission's long-range program is 196. In addition, there are two marine transports.

Bethlehem Delivers First of Robin Type

The first Seas Shipping Company type vessel to be placed in service was delivered March 5th at the Sparrows Point, Maryland, yard of the Bethlehem Steel Company.

The **S. S. Robin Locksley,** a cargo vessel, is 6,800 gross tons, has a normal sea speed of 16½ knots and has passenger accommodations for 12. She will be placed in the Robin Line service from North Atlantic ports to South and East Africa.

This vessel brings to 70 the number of vessels placed in service in the Commission's long-range construction program.

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GENERAL ENGINEERING
and DRY DOCK COMPANY

C-1 Deliveries

Deliveries on the Maritime Commission's cargo vessels of the C-1 type have averaged nearly three months ahead of contract dates.

An unusual record has been set by the Federal Shipbuilding and Dry Dock Co., Kearny, N. J., in delivering all five of its C-1 type vessels at an average of 3.8 months ahead.

The Sparrows Point, Maryland, yard of the Bethlehem Steel Co. has delivered two, and the San Francisco, California, yard of the Bethlehem Steel Co. has delivered one. The record on C-1 cargo deliveries is:

M.C. Hull No.	*Name*	*Builder*	*Contract Delivery Date*	*Date Delivered*	*Months Ahead of Contract*
67	Joseph Lykes	Federal Shipbuilding & Drydock Co.	11/28/40	10/15/40	1.4
68	Zoella Lykes	Do	1/27/41	11/ 7/40	2.7
69	Reuben Tipton	Do	3/28/41	11/29/40	4.
70	Fred Morris	Do	5/27/41	12/27/40	5.
71	John Lykes	Do	7/26/41	1/31/41	5.8
79	James Lykes	Bethlehem Steel Co. Sparrows Point	12/21/40	12/ 4/40	.6
80	Lipscomb Lykes	Do	2/21/41	1/10/41	1.4
84	Cape San Martin	San Francisco, Calif.	3/21/40	2/ 5/41	1.5

All of these eight ships delivered were ahead of contract date by an average of 2.8 months.

Cost of Emergency Yards

The Maritime Commission on February 14 announced clearance with the National Defense Advisory Commission and award of contract for construction of six shipways and other facilities to Louisiana Shipbuilding Co., Inc., New Orleans, Louisiana, at an estimated cost of $4,841,000.

This contract was the last of seven made to provide facilities for constructing 200 emergency cargo ships of simplified design. Contracts for vessel construction have not yet been placed. Active construction work is now proceeding on all of these yards.

The original estimate for cost of the 51 shipways and other facilities provided in the seven contracts was $40,000,000. The President allocated $36,000,000 from his emergency fund.

See table above for details.

Company	*Location*	*No. of Ways*	*Contract Cost of Facilities*	*Estimated No. of Ships*
Oregon Shipbuilding Co.	Portland, Ore.	8	$4,787,000	31
California Shipbuilding Co.	Los Angeles, Calif.	8	4,766,000	31
Houston Shipbuilding Co.	Houston, Texas	6	4,680,000	25
Alabama Dry Dock & Shipbuilding Co.	Mobile, Ala.	4	1,322,500	13
North Carolina Shipbuilding Co.	Wilmington, N. C.	6	5,140,000	25
Bethlehem-Fairfield Shipyards, Inc.	Baltimore, Md.	13	7,838,000	50
Louisiana Shipbuilding Co., Inc.	New Orleans, La.	6	4,841,000	25
Total		51	$33,374,500	200

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Practical Training for National Defense Work

Practical, streamlined, short-term courses, in which men are trained within several weeks to do one specific job, is the partial response of the General Electric Company to the increasing demand for skilled and semi-skilled labor.

In General Electric plants throughout the country, hundreds of young men are learning to run lathes, milling machines, drill presses and grinders; read blue prints, and perform simple assembly jobs preliminary to taking their places in the national defense industrial program.

The short-term courses, though, are not the only way in which General Electric is attempting to meet the labor demands of the National Defense Program.

At all plants, the company is cooperating with the vocational schools of the cities in the conduct of specialized courses.

To Schenectady have come older men from the Erie, Pa., and Pittsfield, Mass., works to learn the details of turbine manufacture in anticipation of the expansion of turbine production facilities.

At the same time, the four-year apprentice training program has been continuing in the company's nine major plants. This program was instituted in 1901, and at the present time, 1015 men are in apprentice courses. All of these apprentices are high school graduates and are at least 18 years old.

The short-term training for specific jobs had its inception in the Lynn, Mass., works, and was begun at Schenectady last August. The extent of the program is limited only by the available facilities. Thousands of men have applied for training and the problem is one of selection rather than recruiting.

Men residing within convenient distance of the various plants are selected, primary consideration being given to their mechanical aptitude or interest. Other factors being equal, preference is given those who have had machine shop experience in industry or in vocational or Federal training schools. Each prospective trainee must be at least 21 years old, must pass the same physical examination given to regular employees, and, in accordance with Federal regulations, must produce evidence of citizenship and a Social Security card.

The majority of trainees are assigned to machine tool operations although many are placed on assembly work.

The training program may run from three weeks to two months or more according to the progress of the individual and production requirements. A continuous feeding of new men into the system takes place, for as one man is advanced another is engaged. As a result of the careful selection, the percentage of trainees failing to show satisfactory progress is surprisingly small, running from 5 to 8 per cent, according to the personnel officials. The enthusiasm of the men is high because most are of the depression generation and are grateful for the opportunity of remunerative employment.

Trainees begin in one of three ways. They may engage in nonproductive work under the direction of experienced men; they may engage in productive work under the supervision of expert operators; or they may observe and serve as helpers to experienced men. Each man learns eventually to set up and run one particular machine or to do a specific job. Some courses include training in blue print reading. In instances where such is not the case, trainees are afforded opportunities to obtain this training through vocational school programs.

Newport News Delivers Third Ship

After satisfactory trials the C-P-3 type passenger liner, President Hayes, was delivered to the American President Lines by the Newport News Shipbuilding & Dry Dock Company and cleared Boston on her maiden voyage early in March. Leaving Boston harbor, she met with a slight mishap and was put back for dry docking and inspection, which set her off schedule approximately ten days. She got away from New York on the 17th with a fine passenger list for California ports and will arrive at San Francisco approximately April 1.

President Hayes is a sister ship to President Jackson and President Monroe, already in the service, and to four more vessels now under construction at Newport News. The fourth ship, S. S. President Garfield, is at this writing just getting her finishing touches after passing satisfactory sea trials, and will start from Boston on her maiden voyage April 1.

The vessels in service are showing very good sea records. President Jackson finished her first round-the-world voyage in 99 days and at an average sea speed of over 18 knots. Her guaranteed sustained sea speed is 16½ knots. Master of President Hayes is Captain E. Dale Collins.

Two New Ore Freighters

A contract for construction of two new ore freighters, the largest ever to be built on the Great Lakes, has been awarded to the Great Lakes Engineering Works, River Rouge, Michigan, by the Pittsburgh Steamship Company, subsidiary of the United States Steel Corporation.

The vessels will be single screw, double reduction gear, turbine-driven

(Page 92, please)

Running LIGHTS

Names in the MARINE SPOTLIGHT of the month

Joslyn - Ryan Joins Forces

Paul Joslyn, formerly chief engineer for Bethlehem and Moore plants in San Francisco Bay area, announces that his firm now has a contract for the U. S. Navy tankers, developing the plans for the Basalt Rock Company, Inc., of Napa, California, as well as two similar vessels for the Lake Superior Shipbuilding Company of Superior, Wisconsin. The Joslyn firm has been designated as design agent for the work covering four vessels.

M. J. Ryan has joined Mr. Joslyn as a partner. He is well known as a naval architect. In the past Mr. Ryan specialized as an authority on matters pertaining to Panama Canal tonnage and toll adjustment for major steamship companies.

In announcing the Joslyn-Ryan partnership Mr. Joslyn stated that the move is designed "in order to provide assistance on Pacific Coast construction awards—with a complete staff situated close to the West Coast yards—to facilitate the handling of work in this territory."

Mr. Joslyn is widely known as a consulting engineer. Offices are located at 200 Davis Street, San Francisco. The firm was in charge of the design work for conversion under assignment from the 13th Naval District, Seattle, of the S. S. City of Baltimore—now named the U. S. S. Heywood—into a troopship, and also handled a similar job on the S. S. Norfolk, now named U. S. S. Neville. This work was done at the plant of the Willamette Iron and Steel Corporation at Portland, Oregon. Austin Flegal is president, and J. L. Jennings is general manager, of Willamette Iron and Steel Corporation. The first vessel was converted in 95 days.

Upon completion of the Neville and Heywood conversions at Portland Mr. Ryan came to San Francisco to join Mr. Joslyn. Mr. Ryan has been technical surveyor for the American Bureau of Shipping and was associated with George Sharp, 30 Church Street, New York, in designing of the C-3 type and C-1 type vessels for the United States Maritime Commission.

Appointed Assistant to President of A. P. L.

Appointment of E. Russel Lutz, assistant general counsel of the United States Maritime Commission, to the post of assistant to the president of the American President Lines, has been confirmed by Dr. Henry F. Grady, president of the shipping company.

Dr. Grady and Mr. Lutz are former associates of the State Department in Washington, where the former served as Assistant Secretary of State and the latter as Assistant Solicitor and Assistant Legal Advisor. In April of 1937, Mr. Lutz left the State Department to

E. Russel Lutz appointed to the post of Assistant to the President of A. P. L.

enter the legal division of the U. S. Maritime Commission.

Mr. Lutz, like his new "chief," Dr. Grady, has a rich background in commerce and international trade which amply qualifies him for his new position as assistant to the president of the American President Lines. Born in Lancaster, Pa., in 1902, Mr. Lutz attended Bethany (W. Va.) College, received his A.B. from George Washington University in 1922 and his LL.B. from Yale in 1926. He did post graduate work at George Washington University in maritime and foreign law, and was admitted to the bar of the District of Columbia in 1927, and to the bar of the United States Supreme Court in 1930.

During his eleven years with the State Department (1926 - 37), Lutz had considerable foreign service, on such jobs as the Mixed Claims Commission, United States and Germany, and the Tripartite Claims Commission, United States, Austria and Hungary (1927-30); the General Claims Commission, United States and Panama (1931-33), and United States and Mexico (1934-37).

Eugene W. Winter

Eugene W. Winter has taken over the marine manufacturers' representative business of his late father, Eugene V. Winter, in San Francisco and will continue under the same firm name of Eugene V. Winter Co. at the same address, 15 Drumm Street.

Eugene W. Winter is well qualified to carry on his dad's business. He holds unlimited chief engineer's tickets for both steam and diesel; is a commissioned inspector of the National Board of Boiler and Pressure Vessels and the California State Industrial Accident Commission.

For the past five years Mr. Winter has been inspector in the San Francisco territory for the Hartford Steam Boiler Inspection and Insurance Company.

With Mr. Winter will be associated his late father's two assistants, Miss Esther Swanson and Felix Billig. Miss Swanson was with Mr. Winter as secretary for about fifteen years and Mr. Billig has been in the business four years.

Eugene W. Winter

M. J. Gigy

J. P. McArthur

The Winter Company represents the Diesel Engine Division of the American Locomotive Co., the American Hammered Piston Ring Division of the Koppers Co., National Transit Pump & Machinery Co., Maxim Silencer Co., Condenser Service and Engineering Co., Inc., Blackburn-Smith Manufacturing Co., Red Hand Compositions Co. and the Gamlen Chemical Co.

New S. F. Man for Worthington

J. P. McArthur, from the marine division at Harrison, N. J., has been transferred to San Francisco as Pacific Coast manager of the marine division of Worthington Pump and Machinery Corporation, with headquarters in San Francisco. Mr. McArthur was in the Eastern marine department for five years. He hails from Altoona, Pa., and was graduated from Pennsylvania State College in 1929.

M. J. Gigy, whom Mr. McArthur succeeds, resigned from the position of Pacific Coast marine manager for Worthington, to join the firm of W. C. Nickum & Sons of Seattle as Chief Engineer. The Nickum organization is making plans at present for a number of shipbuilding companies on various contracts for the U. S. Navy, the work including such jobs as net tenders and seaplane tenders, as well as conversion of Navy transports at Todd Seattle Dry Docks, Inc.

Mr. Gigy came to the Pacific Coast two and one-half years ago from the East. He had been in marine work with the Worthington organization for eleven years. He served two and one-half years with the Bureau of Ships, U. S. Navy Department, Washington, D. C.

Fine Job!

Pacific Marine Review,
San Francisco, California.
Gentlemen:

I beg to acknowledge receipt of your letter of the 24th ultimo, enclosing tear sheet of an article appearing in the current edition of PACIFIC MARINE REVIEW.

I have read this article with much interest, and think you did a fine job.

Yours truly,
W. S. NEWELL.
Bath Iron Works Corp.

Robert Haig, vice president of the Sun Shipbuilding and Dry Dock Co., holds the bottle of champagne with which the S. S. E. H. Blum, newest tanker of the Atlantic Refining Company, is to be launched at the Sun yards at Chester, Pa. With him (left to right) are: Robert H. Colley, Atlantic president; Mrs. E. H. Blum, who sponsored the new vessel; Mrs. Colley and Mr. Blum, vice president of Atlantic in charge of crude oil production, after whom the new vessel was named

Mormacmail Delivered

The cargo liner Mormacmail of Moore-McCormack Lines was delivered Saturday, March 8, at Norfolk, Virginia, to the United States Maritime Commission for the Navy. The vessel will be used as an auxiliary vessel and is the fifth ship of the Moore-McCormack fleet to be taken for such service. The Donald McKay, Mormacpenn, Mormacyork and Mormachawk have already been taken over.

Last of a group of four C-3 cargo liners built for Moore-McCormack at the Sun Shipbuilding and Drydock Company in Chester, Pennsylvania, the Mormacmail has made four trips in the company's service to Brazil, Uruguay and Argentina.

The Mormacmail is one of fourteen ships constructed or being constructed by the Sun yard for Moore-McCormack Lines. The yard first built six C-2 cargo liners for the company, then four C-3's, of which the Mormacmail was the most recent, and is now building four C-3 passenger liners, the Rio Hudson, Rio Parana, Rio de la Plata and Rio de Janeiro. The passenger liners, each with accommodations for 197 passengers, are the first ever constructed with air conditioning in all cabins as well as public rooms, and three of them have been launched. The Rio de Janeiro will be launched in April.

* * *

S. F. Launching

Named to honor a free and independent American press, the United States Lines motorship American Press was launched at 12:45 p.m. March 11 at the Western Pipe and Steel Company plant in South San Francisco.

The 12,875-ton (displacement) motorship was christened American Press by Camilla Chandler, 15 - year - old daughter of Norman Chandler, chairman of the Newspaper Publishers Committee and president of the Los Angeles Times.

Explaining the naming of the new C-1 cargo ship, **Kenneth Dawson,** vice president in charge of Pacific Coast operations for the United States Lines, stated: "To maintain a democracy it is imperative that its citizens be informed. We have seen democracies and human freedom disappear in Europe only after the sources of information in a free press were destroyed.

"It is fundamentally because of its uncensored newspapers that the American public can remain free; protected against tyranny and injustice. It is therefore with pride that we have given the name of the American Press to our new motorship."

The American Press will join its sister ships American Leader, American Manufacturer, American Builder and a fifth ship, not yet named, in the American Pioneer Lines service to the Orient and Australasia until after the war when the ships will go into the New York-Liverpool service.

The American Press is 417′9″ in length overall with a shaft horsepower of 4,000 and a speed of 15 knots fully loaded. Carrying 59 officers and crew, the ship will have comfortable accommodations for eight passengers. The maximum cruising radius is 20,800 nautical miles and the motorship is of electric welded construction throughout. Total dead weight tonnage is 8,975.

Geo. L. Craig

George L. Craig, co-founder of the Craig Shipbuilding Company, passed away on March 7th, at his residence at La Jolla. He was 76.

With his brother, John F. Craig, he came from Toledo to the Long Beach district in 1907. He will be mourned by a host of friends throughout marine circles because of his long career in the shipping field, and his allied interests in Southern California civic affairs.

Captain John Barneson, who worked himself up to the heights of Pacific Coast shipping and oil, died at Hillsborough, California, late in February, after a thirteen-year period of illness.

Born of a seagoing family in Wick, Scotland, Captain Barneson spent most of his youth and received his education aboard his father's ship. He replaced his father as captain when the latter retired.

While in the United States in 1898, he was appointed to command the S.S. Arizona, chartered to transport troops to the Philippines. A year later he was put in charge of the entire United States transport service at San Francisco. In 1903 he entered commercial shipping as a partner in the firm known as Barneson, Hibbard Co. Later, Captain Barneson and his partner sold the shipping firm and he entered the oil industry when he saw the possibility of oil replacing coal as a fuel for ships. His venture expanded and by 1912 became the General Petroleum Company. Recognized as a formidable competitor, it was bought out in 1926 by the Standard Oil Company of New York and Captain Barneson was elected to a vice-presidency of the New York firm.

Captain Barneson leaves three sons, Lionel T., Harold J. and J. Leslie Barneson, all of Los Angeles.

"The Mariners" Make Picture Voyages to Alaska, South Seas

There's always a grand feeling of friendliness prevailing at the meetings of San Francisco's famed Mariners' Club. The monthly events are always the rendezvous of real salt-tanged "sailormen," with Skipper A. T. Hunter and Secretary Stanley Allen piping all hands aboard for an hour or two of genuine good fellowship.

The March and April meetings were right "on the course" and the turnout of "Mariners" was most enthusiastic.

As a diversion for the shipmates, there is always good entertainment. The club has been particularly fortunate in obtaining exceptionally fine technicolor films covering subjects of a maritime interest.

For instance, on March 11 we "journeyed" to the South Seas—via Pan American Airways System — a film which pictured a typical trip to Honolulu, to equatorial Canton Island, to New Caledonia and finally to New Zealand.

At the April meeting was projected a color picture covering a trip aboard a Canadian Pacific liner, through the Puget Sound and British Columbia ports and inland passages to Skagway —thence by rail to the exciting Yukon country. Truly an outstanding bird's-eye panorama of Alaska, scenic wonderland of the world.

Do you remember?

Notes from the April, 1931, issue of Pacific Marine Review

Both interest and attendance are growing in the recently inaugurated Tuesday luncheon meetings of the Propeller Club of California at the San Francisco Commercial Club.

Harry Haviside entertained the luncheon gathering on March 24 with several reels showing the golfing form of Propellers in the recent Spring Tournament at Castlewood Country Club. "A camera doesn't lie"—ancient Chinese proverb — was rightly interpreted. Booming tee-shots and flubbed pokes—all appeared to bring us awe and laughter. A real treat for both the players and the members who were unable to attend. Truly an historical pictorial!

On March 31, the club was addressed by Capt. C. W. Fisher, manager of the Mare Island Navy Yard, on the subject of "Deep Sea Diving."

April 7 the weekly luncheon event will be a film by Transcontinental and Western Air depicting modern plane travel.

On April 14 there will be an address by a guest speaker on a nautical subject; and on April 21, a motion picture will be shown depicting a voyage from San Francisco and Los Angeles Harbor to New York via ports of Central America and Mexico, through the courtesy of the Panama Mail Steamship Company.

Our dear old friend Charles Pratt passed away March 19. He was a wonderful fellow and esteemed by everyone from one end of the waterfront to the other.

We anticipate the arrival of Air Commodore Charles Kingsford-Smith in San Francisco soon and look forward to having this famous globe-circling pilot tell us of transoceanic flights.

Four hundred and thirty-one active members! That's the count of the Propeller roster to date. Recent members are as follows: C. C. Mallory, Fred Dorwood, Captain I. B. Smith, John H. Thies, Louis Levin, John F. Blain, Jr., and Glenn Hoffman.

Westinghouse

A. E. Hitchner, manager of the Los Angeles office of the **Westinghouse Electric & Mfg. Co.** since 1926, has been appointed commercial assistant to the Pacific Coast District manager, as announced by **Chas. A. Dostal** of San Francisco.

At the same time, Mr. Dostal named **Alan J. Bronold,** formerly of Chicago, as manager of the Los Angeles office. Mr. Bronold's appointment will enable Mr. Hitchner to devote his entire time to special sales assignments in the Los Angeles, San Diego, Phoenix and El Paso areas.

A native of Olean, N. Y., Mr. Bronold: graduated as an electrical engineer from Bliss Electrical School, Washington, D. C.; joined Westinghouse at East Pittsburgh, Pennsylvania, in 1926; became branch manager for the Westinghouse Lamp Division, first at Columbus, Ohio, then at Grand Rapids, Michigan; became special representative for the Lamp Division at Chicago; and in 1939 was named manager of the agency and specialties division for the Northwestern District. Mr. and Mrs. Bronold and their 5-year-old daughter will make their home in Los Angeles.

Mr. Hitchner joined Westinghouse in 1909, five years after graduating from Rutgers College as an electrical engineer. After service in Philadelphia, Wilkes-Barre and East Pittsburgh, he became Los Angeles manager in 1926.

W. J. Howell

W. J. Howell of Pittsburgh, Pa., who has been associated with Westinghouse for the past 10 years in various engineering and sales capacities, has been named assistant to Chas. A. Dostal, manager of the Pacific Coast District, Westinghouse Electric & Manufacturing Co., succeeding Paul V. Whaley, who was transferred east several months ago. Pacific Coast District's territory extends east to Salt Lake City, northeast to Central and Western Montana, south to the Mexican border, and southeast to El Paso County, Texas.

A native of Pittsburgh, Mr. Howell graduated from the University of Pittsburgh in 1931 with an electrical engineering degree and shortly thereafter joined Westinghouse at East Pittsburgh, serving in various capacities until November, 1937, when he entered the general sales department. In February last year he became staff assistant in the office of Ralph Kelly, vice president in charge of sales, at Pittsburgh.

J. W. Milliard, Jr.

J. W. Mailliard, Jr., prominent San Franciscan, was elected a member of the board of directors of the American President Lines at their annual stockholders meeting, March 3 to fill the vacancy caused by the death of William Gibbs McAdoo.

A civic leader and business man, Mailliard has been closely allied to the shipping industry. For years he has been engaged in the food importing business, heading the firm of Mailliard & Schmiedell. His other activities have included directorship in the Home Fire and Marine Insurance Company, San Francisco; Pacific Mutual Life Insurance Company, Los Angeles; Fireman's Fund Indemnity Company, San Francisco; the California Pacific Title & Trust, San Francisco; American Trust Company, San Francisco, and the San Francisco Remedial Loan Association.

R. B. Hay Chapman, vice-president of the firm of Johnson & Higgins of California, and resident director of the California company who was recently elected to the Board of Directors of Johnson & Higgins of New York

He was a member of the Golden Gate International Exposition, and is a past president of the Chamber of Commerce, a former San Francisco Police Commissioner and Park Commissioner and a campaign manager of the Community Chest.

S. S. America

Pacific Marine Review,
San Francisco, Calif.

Dear Sirs:

Many thanks for your very kind letter and the pages from the February issue of the PACIFIC MARINE REVIEW in which you feature the new America. We deeply appreciate the excellent publicity given to our ship both in copy and photographs and I know that it will be most helpful in spreading further the story of this greatest of all American ships.

Again thanking you,

Sincerely,
WALTER JONES,
Director of Advertising and Publicity.
United States Lines.

Dinner tendered by The Propeller Club, Port of Honolulu, to Arthur M. Tode, Honorary President of The Propeller Club of the United States. Held at the Pacific Club, Honolulu, Tuesday, March 18, 1941. (Rear row: reading left to right) Captain E. D. Jones, United States Coast Guard (Commanding Hawaiian Division); A. Lewis, Jr., attorney; Earl M. Thacker, second vice-president, The Propeller Club, Port of Honolulu (Thacker Transportation Company); Arthur M. Tode, Honorary President, The Propeller Club of the United States; Henry W. Deas, President, The Propeller Club, Port of Honolulu (Norton Lilly Company); Honorable Lester Petrie, Mayor, City of Honolulu; Randolph Sevier, first vice-president, The Propeller Club, Port of Honolulu (Matson Navigation Company); J. J. Murphy, Member Board of Governors, The Propeller Club, Port of Honolulu (American President Lines)

News of the Propeller Clubs of the United States

The Port of San Francisco

Charles L. Wheeler
President
John E. Cushing
First Vice-President
Arthur B. Poole
Second Vice-President
Hugh Gallagher
Third Vice-President
Eugene F. Hoffman
Secretary-Treasurer

BOARD OF GOVERNORS

Frazer A. Bailey
Capt. Henry Blackstone
John E. Cushing
Fred L. Doelker
Hugh Gallagher
A. S. Gunn
Edward H. Harms
George Jordan
Roger D. Lapham
Marshall Levis
Ira S. Lillick
Capt. Lewis Mesherry
Joseph A. Moore
Arthur B. Poole
Charles L. Wheeler

Captain Stanley Parker, commander, San Francisco District of the United States Coast Guard, was guest speaker at the March 12 luncheon meeting of the San Francisco Port. Charles L. Wheeler presided over a well-rounded program, which included announcements of coming events, with the spotlight on the April get-together with the Los Angeles contingent—at Del Monte.

Captain Parker's talk was particularly adapted to the relation of the Coast Guard to the merchant marine. The history of the service was outlined from its early duties as the nemesis of smugglers back on the other coast—down through the days when enforcement of navigation laws and inspection of documents were prime functions—until the present day, when these essentials comprise the merchant marine relationship.

"Inspection of documents and identity and, in some cases, of equipment, of vessels of the merchant fleet;

"Asistance to vessels of the merchant service which are in distress and to the personnel of such distressed vessels;

"Maintenance of the aids to navigation which guide the mariners on their way;

"Contribution to the investigation of marine casualties resulting in loss of life through membership of service officers on the 'A' Marine Casualty Boards;

"Training of merchant service personnel for the Maritime Commission by the Maritime Training Schools."

On to Del Monte!

Dear Fellow Propeller:

Of course you will want to make plans to attend the joint meeting of the Los Angeles and San Francisco Propeller Clubs at:

DEL MONTE
April 18, 19 and 20

This get-together will open with a Presidents' Dinner(bring your tux) Friday evening and close with a late breakfast on Sunday morning. There will be time for golf, swimming, auto tours and private cocktail and dinner parties.

The hotel has offered special rates as you will note on attached circular. Your ladies, guests and their ladies, will be welcome and appropriately entertained.

This affair is designed as your Club's Annual Spring Social, such as we held last year at the Fairmont for Admiral Land. Remember what a grand party that was! This year we are joining with our good friends in Los Angeles to stimulate mutual Club interest in the big National Convention here this fall. Los Angeles has already pledged a large attendance.

Kindly fill in and mail enclosed addressed postal before March 10 so your House Committee can make reservations and complete plans for this "Propelling" event. Following receipt of your acceptance card you will be forwarded complete program details.

Cordially yours,
C. L. WHEELER, *President.*

Captain Vickery at San Francisco

National Maritime Day, an event presaging greater importance this year in light of the vital national defense preparations, will be observed in San Francisco on Thursday, May 22.

Captain Howard L. Vickery, chief of the building program of the U. S. Maritime Commission in Washington, D. C., has accepted the invitation of the local sponsors to be principal speaker at the Maritime Day lunch, it was announced.

As in the past, the lunch will be under the auspices of the San Francisco Junior Chamber of Commerce, the Propeller Club, the Foreign Trade Association and the Commercial Club, and will be held in the latter's quarters in the Merchants Exchange Building.

Captain Vickery, who has long anticipated a return visit to San Francisco, has accepted the invitation to speak here and bring to the many local marine figures a timely message of unusual interest to them. During his stay, he will visit the several shipyards of the Bay Area where merchant marine and naval construction is progressing at capacity peak.

Press of urgent business has prevented Captain Vickery from visiting the West Coast in recent months and his appearance here is looked forward to keenly by all marine interests.

The Port of Los Angeles

Approximately 75 members of the Propeller Club, Port of Los Angeles No. 66, were guests of the Consolidated Steel Corporation at the launching of the S.S. Agwiprince Thursday morning, March 27, at the Craig yards, Long Beach.

With Ralph J. Chandler, president of the local Propeller Club; Arthur M. Tode, honorary national president, and Charles C. H. Pearsall, past national president of the Propeller Club of the United States, looking on, Mrs. Edward B. Simmons of Coronado swung the bottle of California wine on the bow of the Agwiprince which sent the trim-looking C-1 freighter sidewise down the ways into the channel amid the cheers of several thousand spectators gathered in the shipyards to witness the ever-thrilling event.

Following the launching of the vessel, a luncheon in celebration of the event was tendered officials of the shipyard, the sponsoring party and AGWI officials at the Pacific Coast Club, Long Beach, by the Los Angeles Propeller Club.

Among those introduced by Propeller Club President Ralph Chandler at the luncheon were Captain Claude B. Mayo, U.S.N. ret., superintendent of the California Maritime Academy; Captain Robert Henderson, U.S.N. ret., vice president of the board of governors of the Academy, and Will Rogers, Jr., newly appointed member of the board of governors. Others presented and who said a few words of praise for the new ship were Alden G. Roach, executive vice president of Consolidated, who presented Mrs. Simmons with a beautiful diamond studded wrist watch; J. L. Van Norman, past president of the Los Angeles Chamber of Commerce, and James Craig, head of the shipyard where the Agwiprince was built.

Mr. Chandler was greeted with a round of applause when he presented the sponsor with a bottle of California champagne to replace the one she crashed against the bow of the ship.

Closing the luncheon program at which more than 125 were present, Chandler announced that plans were completed for the joint meeting with the San Francisco Propeller Club at Del Monte April 18, 19 and 20, urging all members to attend this first annual gathering.

Port of Tacoma

The February dinner and meeting of the Propeller Club, Port of Tacoma, was held Tuesday evening, February 25th, at the Tacoma Club. This meeting should have been held on Tuesday, February 18th, but was delayed one week for this month only.

After a very fine dinner, President Gil Ackerman called the meeting to order before one of the largest and most enthusiastic groups of men to ever attend a Propeller Club meeting in Tacoma. Mr. Ackerman first called attention to the recent visit to the Pacific Northwest of Honorary President, Mr. Tode, and of the successful meeting held in his honor in Seattle at which a good representation was on hand from the Tacoma Club. He also spoke of the luncheon given Mr. Tode in Tacoma the following noon at which eighteen members of our Club were in attendance.

The President called on Perry Moore, as chairman of the program committee, to tell what had been accomplished so far in the lining up of future programs which would prove both instructive and entertaining. Mr. Moore spoke of what ideas had come up for discussion at our recent Board of Governor's meeting and then asked the members to give their opinions on what they would like.

It was moved and seconded at this meeting that we would try out the idea of holding a short social period prior to our dinner as it was thought that, in this way, everyone might become better acquainted and more friendly, it being the idea that our past meetings have been just a little too formal. If this idea proves successful, it will be continued indefinitely.

It was decided that at our March meeting to have General Stone, retired Army officer, to address the Club on the subject of National Defense, particularly with reference to the Panama Canal.

Mr. Harry B. Tullis, the Club's newest member, was introduced to the members by Mr. Kennell. Mr. Tullis is with the Shaffer Terminals, Inc.

Mr. Kennell, as chairman of the membership committee, gave a short talk in connection with the drive for new members and asked that all of the members do their best to line up new members in an effort to build up the Club membership and, in this way, help in creating more interest in the Club.

As an added feature at this meeting, all members in attendance were introduced by the member sitting at his right and a few remarks were made by each person as the introduction was made.

J. M. Martinac, of the Martinac Shipbuilding Company, gave a talk in regard to his recent trip to Washington, D. C., in connection with efforts to obtain contracts for the building of small Navy ships in the Northwest.

After Mr. Martinac's talk, moving pictures of the history of the United States Coast Guard were shown. These pictures were under the supervision of Mr. Stillwell of the Coast Guard Service, who was introduced by Phil Gruger. The films were especially interesting and thoroughly enjoyed by every one present.

There being no further business, the meeting was adjourned by President Ackerman.

CHAS. C. CRAMP, *Secretary*.

March Meeting

The regular monthly dinner and meeting of the Propeller Club, Port of Tacoma, was held Tuesday night, March 18, at the Tacoma Club.

This meeting was the best attended and the most enthusiastic of any held since the beginning of the Tacoma Club. Since the meeting last month, a total of ten new members have been admitted to the Club, most of whom were at this month's get-together. These new members include the following:

R. N. Witter, Sperry Flour Co.
Orville Sund, Foss Launch & Tug Co.
W. W. Glenn, Centennial Flouring Mills Co.
Chas. F. Neudorfer, Shaffer Terminals, Inc.
Ralph H. Shaffer, Shaffer Terminals, Inc.
O. G. Kisor, Tidewater Associated Oil Co.
H. G. Flanders, Seattle - Tacoma Shipbuilding Corp.
Phillip Spaulding, Seattle - Tacoma Shipbuilding Corp.
Dave Neilson, U.S. Maritime Comm.
F. W. Lambert, U. S. Maritime Comm.

The new members and visitors were introduced to the Club after which President Ackerman spoke in regard to the recent Board of Governor's meeting at which time Senate Bill No. 287 was discussed. This bill had to do with the dumping of pulp mill waste into any waters of Puget Sound at a line near Port Angeles. Mr. Ackerman reported that wires were sent to all of our Senators and Representatives in Olympia, opposing this bill and that he later received a letter from Lieut. Governor Victor A. Meyers in which he advised that this bill was not acted on at this session of the Legislature.

The principal speaker of the evening was Major General David L. Stone, retired, whose subject was "The Panama Canal and Its Defense." General Stone's address was by far the most interesting and instructive ever heard at any of our meetings. He explained in detail of his sojourn at the Canal, having been transferred there from Fort Lewis, and of his pleasant relationship with the neighboring Central American Republics and Colombia in South America.

Immediately after the General's talk, many questions were asked him relative to the defense of the Canal at the present time, after which the meeting was adjourned.

Chas C. Cramp, *Secretary*.

Bilge Club Banquet

The members of the Bilge Club, Los Angeles Harbor shipping fraternity, together with their guests gathered at the Los Angeles Biltmore Hotel on Saturday, February 22nd, for their annual banquet. The number thirteen has no further terrors for the Bilgers for this, the thirteenth annual banquet, was "tops," drawing far more of its members and guests than any of the previous banquets.

President Lloyd Moore had previously granted shore leave to all Bilgers, their friends and guests and directed that they appear in person at the Biltmore ready and willing to adhere to the following schedule:

6:30 p.m.—Liquid refreshments (bottoms UP)
7:30 p.m.—Dinner (bottoms DOWN)

After meeting old shipmates at the bar, the Bilgers proceeded to the banquet hall where President Moore greeted them with a few well-chosen words. He invited the attention of those present to the fact that someone (anonymous) had added to the house flag of his company, the General Petroleum Co., thereby giving Pegasus some additional appendages not sanctioned by his home office.

Turning to with gusto, the Bilgers did full duty to the Biltmore's chow, after which they were entertained by twelve acts of vaudeville with Rookie Lewis as M.C. and accompanied by Edith Griffith and her All Girl Orchestra.

The attendance at this function (366) reflects the year-to-year growth of the Bilge Club and disposes of any possibility of the club holding this annual affair in the harbor area for lack of adequate facilities to handle such a number of members.

WILLIAM A. MASON,
Lieut. Commander, U.S.N. (Ret.)

N. Y. K.

Honor was paid early in March to **Edward G. White,** general passenger agent for the Nippon Yusen Kaisha by leading steamship and travel executives at a dinner in San Francisco aboard the McCormack Lines Hollywood. He left shortly thereafter to attend the Trans-Pacific Passenger Conference at the Palmer House, Chicago.

Alexander McNab Is Mourned

It was our great pleasure to greet **Commander Alexander McNab** when he arrived in San Francisco just a few weeks ago.

The news of his sudden passing comes to us as an extreme sorrow, for we of PACIFIC MARINE REVIEW counted him as a real friend whom we have revered for over twenty years. The final few days he spent with us in San Francisco will always be cherished in our memory of a man whose accomplishments were many—a man who valued his friendships above all else.

Homeward bound from the Coast, where he had visited old "buddies" of an earlier day, Commander McNab was suddenly stricken while aboard a train near Sanderson, Texas.

Alexander McNab was a former Commander of the British Navy. To his credit are many inventions of marine safety devices used by the British Navy. Establishing his firm McNab of Bridgeport, Inc., in Connecticut he is responsible for many installations of indicators, navigation instruments, and engine room products in a long list of naval and merchant marine vessels.

Born in Scotland he still maintained a touch of the delightful dialect, which was one of his greatest charms. It was at the age of fourteen that he joined the Royal Navy as a Midshipman. A series of promotions saw his advancement through the engineering ranks and before he retired to come to this country he had attained the status of Engineer Lieutenant Commander.

During the World War he worked for the Government and was pressed into service which required several business trips to England. Later he was owner of the Marine Iron Works in New London, Connecticut.

During his March trip to the Pacific Coast he visited the Seattle-Puget Sound district, making the appointment of new sales representation for his firm. While in San Francisco he had the delightful experience of reminiscing on the "good old days" with several old-timers who were his friends of forty years standing. One of his best loved engineering "cronies" was Bernard Mills of American-Hawaiian Steamship Company.

It is with profound grief that we chronicle the passing of a man whose career gained for him countless friends throughout the maritime world.

* * *

Master of Mormacsea Succumbs

Commander K. H. Donavin, assistant to the president of Moore-McCormack Lines, Inc., has regretfully announced the death of Captain W. T. F. George, master of the S. S. Mormacsea, a few hours after his ship cleared from Los Angeles, Sunday, March 30th, en route on the maiden voyage to the east coast of South America.

Chief Officer Leland E. Cudahy was assigned to take command until the vessel arrives at the Canal Zone. Captain Hans E. Hansen has flown to the Canal to take charge of the Mormacsea from that point. He has been standing by to take over the Mormacsun, third C-3 building at Moore Dry Dock, Oakland, for Moore-McCormack Lines, ready for service about the middle of May.

For more safety, longer life and better piping systems-weld with
TUBE-TURNS
COMPACT
LIGHTER
STRONGER

The only elbows and returns that can be cut to any angle and still retain uniform wall thickness!

SIX VITAL ADVANTAGES make Tube-Turns welding fittings *especially preferred* by marine engineers. (1) They require LESS SPACE, due to short radius design and adaptability to *any* angle. (2) They are SAFER, because outer walls are *never* stretched or thinned. (3) They permit EASIER WELDING *and faster installation*, because of absolutely uniform wall thickness. (4) They WEIGH LESS, due to absence of flanges, bolts, nuts and heavy cast steel construction. (5) They LAST LONGER, because smooth inner walls reduce corrosion and erosion. (6) They virtually ELIMINATE UPKEEP COSTS AND WORRY, because *joints are permanently leak-proof.*

THE ORIGINAL SEAMLESS WELDING FITTINGS

The complete Tube-Turns line includes types and sizes for every shipbuilding requirement: 90°, 45°, and 180° elbows and returns, tees, reducers, heads, nipples, laterals and flanges. Write for Catalog 109—it's packed with helpful new data for marine engineers!

TUBE-TURNS

TUBE-TURNS, INC., LOUISVILLE, KY.

PACIFIC COAST OFFICE: 210 W. 7th St., Los Angeles. Phone Van Dyke 4762

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Portland, Ore. *Woodbury & Co.*
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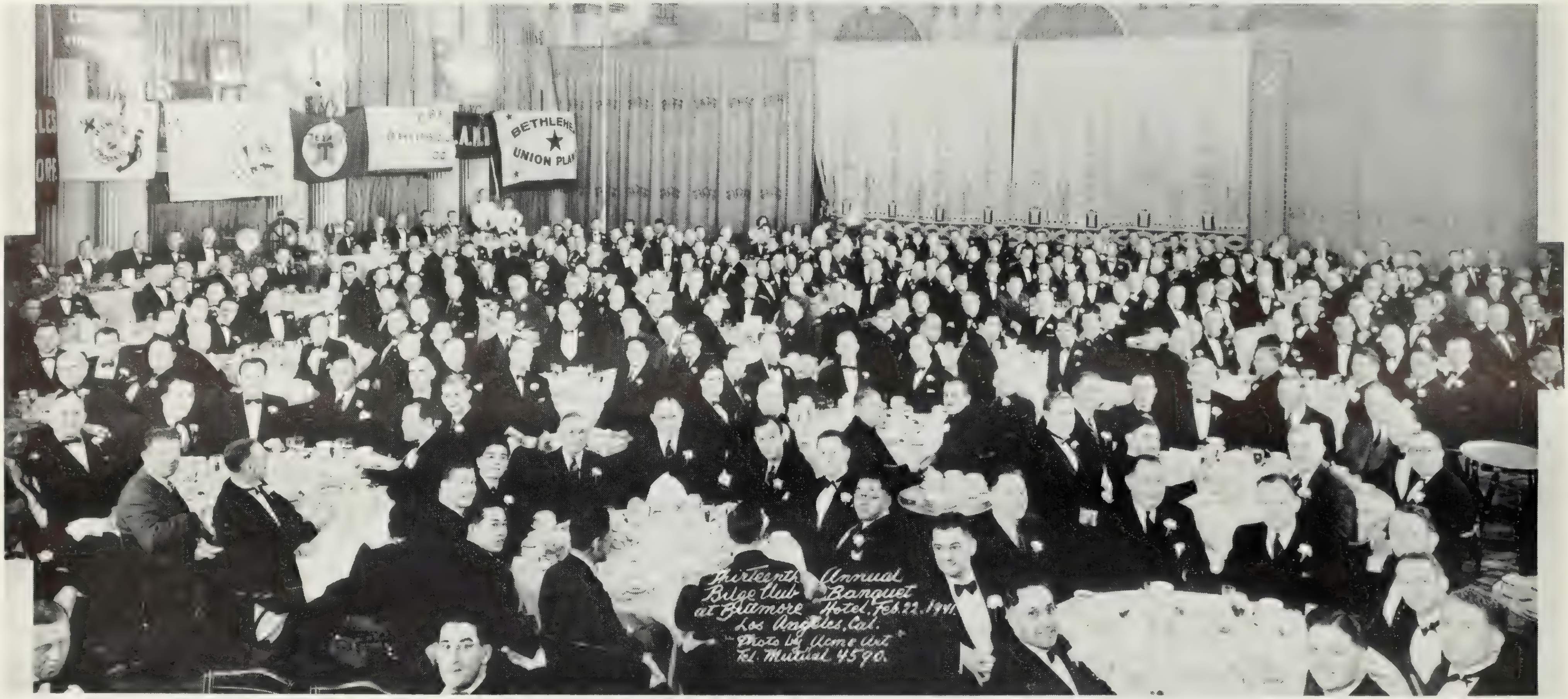
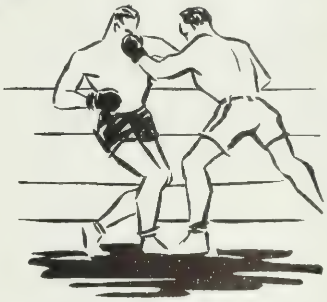
Prompt delivery thru distributors located in or near every shipyard in the U. S. A.



Bilgers of the Los Angeles Harbor ports of call came "down town" on the evening of Washington's Birthday to enjoy the club's 13th Annual Banquet. The unique organization is comprised of maritimers around Southern California's shipping lines, shipyards and marine-supply offices. Good fellowship is the keynote when these boys of The Bilge Club get together

Thicknesses from 1/64" to 1/4". Sheets 40" x 40" and larger.

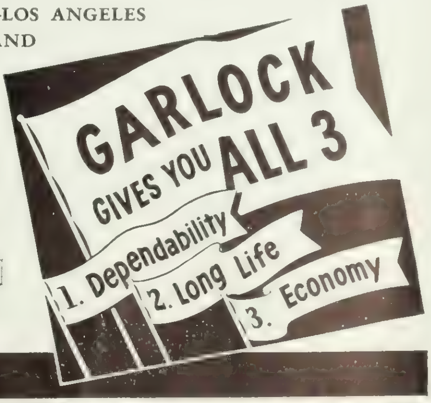
Garlock 7021



WILL TAKE PLENTY OF PUNISHMENT!

Under the most severe conditions—such as superheated high pressure steam and light oils at high temperatures—Garlock 7021 Compressed Asbestos Sheet Packing will *stand up* where ordinary gasketing materials fail. Avoid gasket failures and expensive shut-downs—use Garlock 7021.

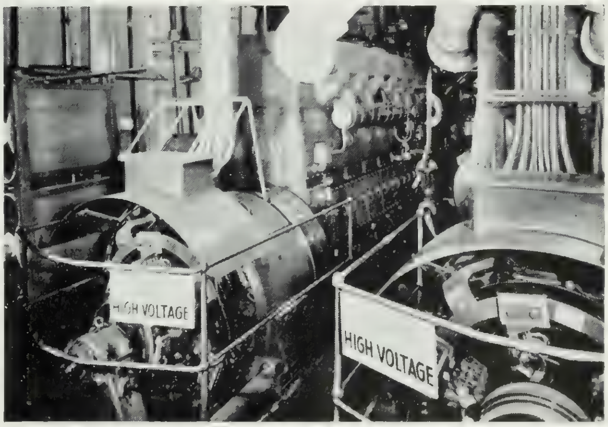
THE GARLOCK PACKING CO., PALMYRA, N.Y.
In Canada: The Garlock Packing Co. of Canada Ltd., Montreal, Que.
SAN FRANCISCO—LOS ANGELES
SEATTLE—PORTLAND



Superior DIESEL DEPENDABILITY

From MOTORSHIP—*February, 1941*

Seldom has a new ship been put to a more gruelling test, and come through it more successfully than the motorship Sea Witch, which vessel arrived in New York on December 30, 1940, after a round trip of 31,000 miles to the Far East, and left again on January 11 on a second similar voyage.



The two 6-cylinder 11½" x 14", 450 H. P. SUPERIOR Diesels that furnish all the auxiliary power for the "Sea Witch."

Worthy of note is the performance of the two Superior auxiliary Diesels driving the generators which furnish all auxiliary power. These engines operated steadily throughout the five months period covered by the voyage without the slightest trouble. On the occasion of our visit to the ship we had occasion to note the steadiness of the unit in operation. The wide variations in load due to operation of cargo winches was indicated by the violent swings of the ammeter on the switchboard, which oscillated between 800 and 1300 amperes with no noticeable effect on the steadiness of operation of the generator set.

These generator engines operated throughout the voyage with the same low grade fuel as used in the main engines. Upon arrival in New York the engines were opened up by the builder's workmen, the first time the cylinders had been opened since the engines left the plant of the builders. All were found in good order with the exception of some carbon in the ring slots and some rings that were worn enough to warrant renewal.

THE NATIONAL SUPPLY COMPANY
SUPERIOR ENGINE DIVISION
FACTORIES: Springfield, Ohio; Philadelphia, Pa.
SALES OFFICES: Springfield, Ohio; Philadelphia, Pa.; New York, N. Y.; Los Angeles, Calif.; Jacksonville, Fla.; Houston, Texas.

Names in the MARINE SPOTLIGHT of the month

Fourteen members of the Chamber of Commerce of Portland, Oregon, sailed March 19 aboard the Matson liner Lurline for a business development tour to Hawaii. A similar mission was conducted last year by the San Francisco Chamber of Commerce.

* * *

Stanley Page, passenger traffic manager of the General Steamship Company, returned the latter part of March from a three weeks' visit in Mexico.

* * *

H. B. Beaumont, assistant passenger traffic manager of the Canadian Pacific Lines, was a San Francisco visitor in March.

* * *

J. M. Bond, manager of the San Francisco office of the International Paint Company (California), Inc., announces that James Lukens has joined the sales staff. Jack also announced that the company expected to be in their new quarters, 970 Tennessee Street, by April 1 with a new telephone number, ATwater 4720.

* * *

E. L. Matteson, general agent of the American President Lines in Kobe, Japan, was elected as president of the internationally-known Kobe Club, whose membership is comprised mostly of British residents in the Orient. In the seventy years' existence of this club, Mr. Matteson has the honor of being one of only three Americans ever holding this high office in this exclusive men's club.

* * *

March changes in commands as announced by the American-Hawaiian Steamship Company included: Capt. E. E. Greenlaw, who replaced Capt. O. Lee on the Columbian; Capt. E. M. Shigley, transferred from the Honolulan to the Arkansan; Capt. E. S. Sutton, transferred from the Arizonian to the Honolulan; Capt. W. F. M. Scorah, resumed command of the Floridian after a leave of absence to attend the United States Naval Reserve School.

* * *

Back from retirement has come **O. T. Helpling** to become traffic manager for the L. E. Dixon Co.'s cantonment building project at San Luis Obispo. For seventeen years he has been an outstanding personality in Southern California as an industrial traffic manager and traffic attorney. He was traffic manager for the huge Colorado River Aqueduct Project of the Metropolitan Water District of Southern California from 1933 to its completion in 1939.

* * *

R. S. Wintermute has joined the Siegfried Olsen Line in San Francisco to be in charge of the steamship department. His former post was with the General Steamship Corporation in Seattle, Washington.

* * *

Capt. Sten Sahlberg becomes owners' representative of the Johnson Line with headquarters in the W. R. Grace & Co. offices in San Francisco. Capt. Sahlberg, prominent as shipmaster and officer for the company's motorships, replaces **Capt. Karl Andreason** who held this post for the last four years. Capt. Andreason sailed in March for Stockholm aboard the company's motorship Brasil.

Water Follies

An attendance that taxed the capacity of the Terrace Room at the Fairmont Hotel enjoyed the many novel features presented by a hard-working committee when the fifeenth annual steamship night celebration of the Pacific Traffic Association was held on Tuesday evening, March 11th.

Highlight of the evening was the interest displayed by local shipping and traffic men in the speech delivered by **Dr. Henry F. Grady,** president of the American President Lines, who chose as his subject "The Probable Future Course of American Shipping." Dr. Grady's analysis of this subject on which he is particularly posted as a result of his wide experience in Washington, proved of absorbing interest to his audience.

F. H. Rosencrants, Vice President of Combustion Engineering Company, Inc., has assumed responsibility for the activities of the company in the marine field, and W. H. Armacost has been designated as chief engineer of this department. Mr. Rosencrants has long been well known in the stationary power plant where he has been associated with many important installations. A graduate of the University of Nebraska, he taught at Oregon State College from 1911 to 1926, then became mechanical engineer of the Texas Power & Light Co., and from 1918 to 1924 was with the Electric Bond & Share Co., in charge of steam station design. From 1924 to 1930 he was chief engineer of International Combustion Engineering Co., Ltd., London, England, and shortly after returning to this country was made a vice president of Combustion Engineering Company, Inc., New York

The entertainment of the evening was the spectacular presentation of the 1941 Water Follies, featuring leading aquatic stars like Helen Crlenkovich, national A.A.U. diving champion.

Chairman of the committee in charge of all arrangements was American-Hawaiian's Frank Herberth, Jr. Assisting him were John Hanavan, Furness Lines; Guy Shelton, Luckenbach Line; John R. Wagner, American President Lines, and William Gleason, McCormick Steamship Company.

* * *

Announcement was made recently of the appointment of **Peter M. Mitchel,** as manager of the Pittsburgh office of Moore-McCormick Lines. Mr. Mitchel, who was formerly manager of the company's office in Memphis, has recently been connected with the Chicago office.

Former Nelson Line Official Receives Appointment

Announcement was made recently of the appointment of Major F. W. S. Locke, veteran steamship executive, as export traffic manager of the Walsh Construction Co. The company, which now has offices in Long Island City, recently acquired important contracts to supply materials to be used in the construction of an Army base in Trinidad, and has opened new offices at 41 East 42nd Street, Manhattan.

Major Locke started his career in shipping in 1903, after an honorable career in the British Army which included service in South Africa during the Boer War. He was residing in Seattle when the World War broke out in 1914 and immediately sailed for England to rejoin the South Lancashire Guards. He served until 1917, when he was wounded in action and invalided home.

Major Locke was for many years executive vice president of the Nelson Steamship Line, directing the operation of a fleet of ships in the intercoastal trade. This line was owned by the Nelson lumber interests, and its ships carried large cargoes of lumber eastbound and returned to the Pacific Coast with general cargo. Prior to this association he was identified with lumber and steamship lines on the Pacific Coast and the Gulf, including the Pacific Spruce Corporation and the Chicago Lumber and Coal Company.

Major Locke's most recent position was that of export traffic manager of the Ore Steamship Company, a subsidiary of the Bethlehem Steel Company. In shipping circles he is ranked among the most capable executives, as was indicated in 1936 when he was drafted by the United States Army Engineers as commercial advisor to the governmental body which was studying the commercial possibilities of the proposed Florida ship canal. He was called in when the government considered renewal of the project on which about $5,000,000 had been spent. During various investigations of intercoastal shipping by the United States Shipping Board, predecessor of the present Maritime Commission, Major Locke testified as an expert.

Contracts Delayed

In a recent speech, prepared by Henry F. Grady, president of the American President Lines, and read to the Pacific Traffic Association by M. J. Buckley, vice president of A. P. L., Grady declared that his contacts at Washington disclose the fact that uncertain conditions in labor and material costs are holding up contracts for the construction of the two $28,000,000 passenger liners for transpacific service.

The only bid on these ships was made by Seattle-Tacoma Shipbuilding Corporation. This bid was said to be satisfactory to the Maritime Commission, who are still trying to work out a satisfactory contract.

HUNT-SPILLER GUN IRON

Solves a Big Problem in Steam and Diesel Operation

Hunt-Spiller Air Furnace Gun Iron Cylinder Liners, Pistons, Piston Rings and Heads will help you to solve the major problem of wear in Steam and Diesel operation.

Extending the period between renewals, this wear-resisting material is helping many operators to obtain maximum efficiency, minimum fuel consumption, and low maintenance costs.

Skilled metallurgical control and foundry practice insures constant uniform material.

Regardless of age, make or design of engine, HUNT-SPILLER AIR FURNACE GUN IRON applied to your cylinder parts will produce maximum efficiency and reduce renewals.

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383 Dorchester Ave.

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Vice President
South Boston, Mass.

Thos. G. Baird
16 California Street
KF 1142
San Francisco

HUNT - SPILLER *Air Furnace* GUN IRON

Cadet Engineering Officer Joseph J. Antolic, chosen as the outstanding cadet of the y
for his proficiency rating of 97 per cent, received the Maritime Commission award a
ceremony aboard the S. S. Exporter, American Export Lines, Pier D, Jersey City. John
Gehan, vice president of American Export, who made the award, said that Cadet Anto
led all deck and engine cadets in the American merchant marine in proficiency. In additi
to the Maritime Commission award the honor man received a cash award for leading
cadets in American Export Lines' service. Cadets taking Maritime Commission traini
pursue studies while at sea and are quizzed by examiners upon their return from ea
voyage. They must also take annual examinations covering each of the subjects th
comprise their courses

Women's Traffic Club

The Women's Traffic Club of San Francisco, at its installation party held at the Palace Hotel on March 18th, installed the following officers:

Miss Janet Davis, American-Hawaiian Steamship Co., president; Mrs. Mary-Lu Bunnell, vice-president; Miss Ethel Singer, secretary, and Mrs. Berneice Stuart, treasurer. Miss Nan G. Lawrence, Mrs. Gertrude Verbarg and Miss Ruth Casella were installed on the Board of Directors.

Miss Nan G. Lawrence, of San Francisco Machinery Dealers Association, charter member and past president of the club, was mistress of ceremonies.

The following have been appointed to act as chairmen of committees:

Miss Kay Bugbee, Luckenbach Steamship Co., entertainment.

Miss Irene Mackin, Haslett Warehouse Co., membership.

Miss Marcia Morris, J. E. Lowden Co., program.

Miss Muriel McCarthy, Funsten Co., publicity.

Miss Mabel Delucchi, American President Lines, reception.

Mrs. Gertrude Dibble, Toumey Electric & Engineering Co., research.

Miss Elveta Chavez, Stecher Traung Lithograph Corpn., ways and means.

Miss Sonya S. Marks, Shipowners' Association of the Pacific Coast, editor.

◆

Harry Adams became Lieutenant Adams during the month of March, reporting to the headquarters of the Twelfth Naval District in San Francisco. He was called by the Naval Reserve, effecting a leave of absence from his post as San Francisco representative of the Port of Oakland.

◆

Allen J. Harris, president of Walter Castenado, Inc., of New Orleans has announced the addition of **S. G. Davis** to the organization.

Mr. Davis will be actively engaged in sales engineering work, handling the well-known products of Cochrane Corporation, Peabody Engineering Corporation, Shutte & Koerting Company, DeLaval Separator Company, Ames Iron Works, The Hays Corporation, Zallea Bros. & Johnson, Schubert-Christy Corporation, DeLaval Steam Turbine Company, Binks Manufacturing Company, Northern Equipment Company, United Conveyor Corporation, Yeomans Brothers Company, American Arch Company.

◆

W. C. Bennett, appliance division sales manager of Cochrane Corporation, Philadelphia, has announced the appointment of **W. W. Tomes** to head the Flow Meter Section. Mr. Tomes graduated from Purdue University in 1928 and has been associated with the Firestone Tire & Rubber Company in flow measurement and steam distribution work and, more recently, in meter field engineering and sales work.

Assisting Mr. Tomes will be W. C. Morrison, lately associated with the Brooklyn Union Gas Company as a sales engineer. Mr. Morrison attended the University of North Carolina and was graduated from Brooklyn Polytech in 1936.

◆

Erik Krag, executive vice president of Interocean Steamship Corporation, recently announced "Mr. Donald Watson, who joined us in 1933 with the inauguration of the inter-coastal service of **Pacific Coast Direct Line** has been appointed Pacific Coast manager by the principals of this line, with offices at 311 California Street, San Francisco (seventh floor).

"The Interocean Steamship Corporation continues as general agents for the line at all Pacific Coast ports.

"The following promotions are made in our staff: Mr. W. A. Baxter to the position of traffic manager, and Mr. E. C. Stimson to general freight agent in charge of solicitation for the Pacific Coast Direct Line, effective April 1, 1941."

Net Tender Launched

First of Four U.S. Navy Anti-Submarine Net Tenders at Alameda Yard

A U. S. Navy anti-submarine net tender, first of four under construction at the Alameda yard of the General Engineering & Dry Dock Company of San Francisco, was launched at noon, March 27.

She was christened U. S. M. S. Buckthorn by Mrs. Rosalie Beuton Day and slid gracefully into the waters of the Estuary that forms the joint inner harbor and the limit line between the cities of Oakland and Alameda, Calif.

The choice of sponsor is interesting and forms a very graceful tribute to the workmen who built this vessel, as Mrs. Day is a niece of Fred Jones, chief shipfitter on the job.

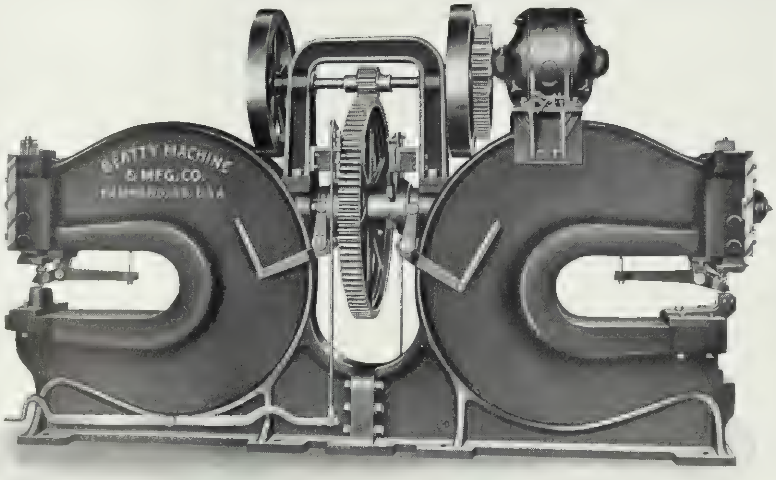
The vessel is of steel, 140 feet long. She will be propelled by a single screw, driven by two 550-horsepower Westinghouse direct current motors operating through a single reduction gear set. The motors turn 1000 rpm and the propeller 160 rpm at full power.

Electric energy is developed by two Westinghouse dc generators, each directly connected to a 650-shp Enterprise diesel engine.

Auxiliary power and light are provided by two Buda diesel generating sets, one of 90 shp and the other 60 shp.

The entire power plant is furnished by the Enterprise Engine Company of San Francisco, which firm is supplying the power plants for a large number of this type of Naval auxiliary. The ship will be equipped to handle large steel nets used in mouths of harbors and in restricted channels to prevent the passage of submarines.

BEATTY Modernized
POWER PUNCHES and SHEARS



The No. 6 Double End Punch. Beatty punching machines have various size throat depths in both single and double ends.

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Coast Shipyards

Beatty Products are now being made available for Pacific Coast yards.

To meet your urgent requirements, we offer a complete line of punching and shearing equipment with superior construction advantages which will satisfy the most exacting buyer who requires machines that will stand up for years with minimum attention.

BEATTY EQUIPMENT eliminates unnecessary handling through combination set ups, and large die space, thereby increasing production and reducing costs.

Let
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Solve
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Problems

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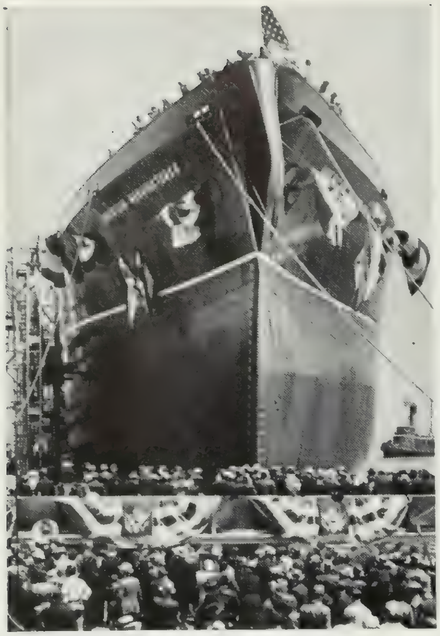
BEATTY MACHINE & MFG. CO.
HAMMOND, INDIANA

PROGRESS IN *American Shipyards*



Pacific Coast

ASSOCIATED SHIPBUILDERS
Seattle, Wash.

New Construction:

One insulated self-propelled lighter for delivery to U. S. Navy at Puget Sound Navy Yard.

Four small seaplane tenders for delivery to Puget Sound Navy Yard.

Conversion:

City of Newport News to transport U. S. S. Fuller.

ASTORIA MARINE CONSTRUCTION CO.
Astoria, Ore.

New Construction:

Hull No. 1100, wood hull troller. 41′ x 11′ x 4′6″; Chrysler Crown engine. **Delivery date April 1, 1941.**

Hull No. 1090, wood hull trawler for stock. 56′ x 15′6″ x 7′6″; 135-hp Superior diesel engine.

Hull No. 1111, wood hull trawler. 60′ x 12′ x 6′; 100-hp Caterpillar diesel engine. **Delivery date April 1, 1941.**

BASALT ROCK CO., INC.
Shipbuilding Yard
Napa, Calif.

New Construction:

Eight steel open lighters; owner, Bureau of Supplies and Accounts, Navy Dept., Washington, D. C. Delivery at Mare Island. 110′ x 34′ x 11′3″. Contract awarded September 5, 1940. **Delivered.**

Twelve steel seagoing 1000-ton cargo barges; contractors, Pacific Navy Air Bases. Delivery at San Francisco Bay. 150′ x 40′ x 12′. Contract awarded November 15, 1940. **Delivery dates, first two about April 15; thereafter one every 7 or 10 days.**

Two 10,000-bbl. fuel oil tankers for delivery to Mare Island Navy Yard. 235′ x 37′ x 19′; cost $1,800,000. Contract awarded by Navy Dept., Bureau of S. & A., Washington, D. C. Keel laying date, May 15, 1941.

BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Division
San Francisco Yard
San Francisco, Calif.

New Construction:

Hulls Nos. 5361-5364, four C-1 cargo vessels for U. S. Maritime Commission. 395′ x 60′ x 37′6″; 6400 gross tons each; 4000-hp. Full scantling steam propulsion type. Keel laid, No. 5364, January 15, 1941. **Launching** dates, No. 5361, October 4, 1940; No. 5362, January 10, 1941; **No. 5363, March 12, 1941; estimated delivery date, No. 5361, March 25, 1941.**

Twenty-five 2100-ton destroyers for U. S. Navy.

Hulls Nos. 5366-5367, two 1650-ton destroyers for U. S. Navy. Keels laid January 13, 1941.

Four 6000-ton cruisers for U. S. Navy.

BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Division
San Pedro, Calif.

New Construction:

Ten 2100-ton destroyers for U. S. Navy.

COMMERCIAL IRON WORKS
Portland, Ore.

New Construction:

Four anti-submarine net tenders.

CONSOLIDATED STEEL CORP., LTD.
Los Angeles, Calif.

New Construction:

Hulls Nos. 156-159, four C-1-BT, full scantling, turbine propulsion cargo vessels for U. S. Maritime Commission. **Keel laying date, No. 159, April 1, 1941. Launching dates, No. 157, March 27, 1941;** No. 158, May 29, 1941; No. 159, July 24, 1941. Delivery dates, No. 156, May 15, 1941; No. 157, June 25, 1941; No. 158, August 5, 1941; No. 159, October 3, 1941.

Hulls Nos. 181-182, two Design P1-S2-L2 twin screw turbine propulsion transports for U. S. Maritime Commission. Launching dates January 5 and June 8, 1942. Delivery dates September 26 and November 5, 1942.

Hulls Nos. 162-193; 208-221, 46 steel lighters.

GENERAL ENGINEERING & DRY DOCK CO.
Alameda, Calif.

New Construction:

Four anti-submarine net tenders for U. S. Navy.

Four mine sweepers for U. S. Navy.

HARBOR BOAT BUILDING CO.
Terminal Island, Calif.

Fifteen 60-foot U. S. Navy boats. First boat launched March 8, 1941.

LAKE WASHINGTON SHIPYARDS
Houghton, Wash.

New Construction:

Four anti-submarine net tenders.

Four thousand A. S. N. T. floats.

Coast and Geodetic Survey ship.

Six seaplane tenders for U. S. Navy.

LOS ANGELES SHIPBUILDING & DRY DOCK CORP.
Los Angeles, Calif.

New Construction:

Hulls Nos. AR6-AR8, three repair vessels for U. S. Navy.

MOORE DRY DOCK CO.
Oakland, Calif.

New Construction:

Hulls Nos. 197, Mormacsea; and 198, Mormacsun; two C-3 vessels for U. S. Maritime Commission. LOA 492′0″, LBP 465′; breadth molded 69′6″; depth molded 42′6″. **Delivery dates March 14** and **May 1, 1941.**

Hulls Nos. 199-200, two caisson gates for Bureau of Yards and Docks; one for D. D. No. 2, Pearl Harbor, T. H.; one for D. D. No. 5, Puget Sound, Wash. 150′ x 22′ x 57′; 1800 tons weight. Delivery dates May 15 and June 1, 1941.

Hulls Nos. 201-203, three cargo and passenger vessels for U. S. Maritime Commission and Alcoa Steamship Co. 442′x62′x25′; depth molded to bridge deck 41′6″; 8500 hp; 17 knots speed; passenger carrying capacity 38. Estimated keel laying dates March 19, June 16 and September 10, 1941. Estimated delivery dates January 1, March 15 and June 1, 1942.

Hulls Nos. 204-206, three defense vessels for U. S. Navy and Dravo Corp. 110′ x 34′ x 11′3″ molded depth; two diesel-driven generators.

Two submarine tenders for U. S. Navy.

Five submarine rescue vessels for U. S. Navy.

Six C-2 cargo vessels.

Conversion:

Hull No. 195, U. S. S. Tangier, to seaplane tender for U. S. Navy.

OLSON & SUNDE MARINE WORKS
Seattle, Wash.

New Construction:

One 57-foot combination salmon seine diesel boat for Henry Bowman, Wrangell, Alaska. Cost, with equipment, $24,000. **Completion date April 1, 1941.**

MARINE PAINTS FOR EVERY NEED

PACIFIC PAINT & VARNISH CO.

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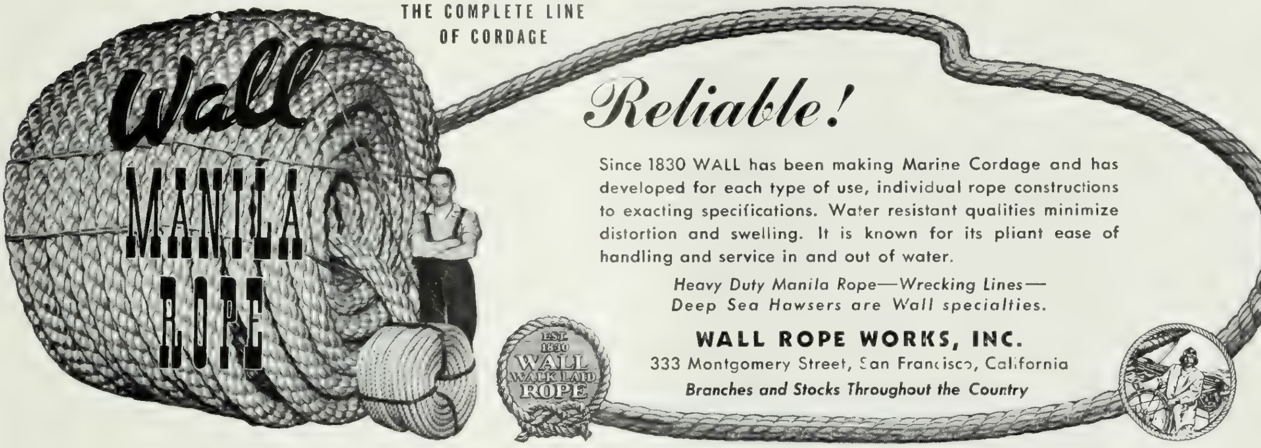

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Since 1830 WALL has been making Marine Cordage and has developed for each type of use, individual rope constructions to exacting specifications. Water resistant qualities minimize distortion and swelling. It is known for its pliant ease of handling and service in and out of water.

Heavy Duty Manila Rope—Wrecking Lines—
Deep Sea Hawsers are Wall specialties.

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1,000,000 pumps to date . . . here at Viking we're pretty proud of that accomplishment. But we know that what really counts, both with us and with you, is what these 1,000,000 pumps have done. Many Viking Rotary Pumps are still in use after 20 and 25 years of constant service. Viking installations are to be found in practically every industry, in all 48 states and in countries the world over. They have saved millions of pumping hours and dollars, made possible the production of many new products, helped streamline modern industry. In building 1,000,000 pumps we've learned a lot about pumping problems and how to solve them. Perhaps we can help you. Write for Bulletin 2100-35.

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Keep down your maintenance costs by standardizing on proven, all-purpose Fuller Yacht Finish.

W. P. FULLER & CO.

PACIFIC BRIDGE CO.
San Francisco, Calif.

New Construction:

One seagoing drydock for U. S. Navy. Cost $1,649,000.

PACIFIC DRY DOCK & REPAIR CO.
Oakland, Calif.

New Construction:

One all-welded steel oil barge. 148′ x 38′ x 9′; 300,000 gal. capacity.

Lighters. Cost $284,572.

SEATTLE-TACOMA SHIPBUILDING CORP.
Tacoma, Wash.

PLANT No. 1

New Construction:

Hulls Nos. 1-2; No. 3, Cape Cleare; No. 4, Cape Fairweather; No. 5; five C-1 cargo vessels for U. S. Maritime Commission. Single screw, full scantling diesel propulsion type. Two General M. A. N. 2100-hp engines; 14 knots speed. **Launching dates, No. 4, April 1, 1941; No. 5, April 15, 1941. Delivery dates, No. 1, April 1, 1941; No. 2, April 30, 1941;** No. 3, May 31, 1941; No. 4, July 6, 1941; No. 5, September 4, 1941.

Hulls Nos. 6-7, 2 C-3 shelter deck type cargo steamers for U. S. Maritime Commission. To be converted on completion to U. S. Army troopships. **Keel laying dates, April 15** and May 15, 1941. Launching dates, August 1 and September 15, 1941. Delivery dates, November 20 and December 29, 1941.

Hulls Nos. 8-11, four C-3 cargo ships for U. S. Maritime Commission. 465′ x 69′6″ x 42′6″ (molded); 8900 tons; 8500-hp steam turbine propulsion; cost $2,990,000. Keel laying dates, August 8, September 22, December 8, 1941, and January 28, 1942. Launching dates, December 1, 1941, and January 20, March 8, May 6, 1942. Delivery dates, February 7, March 19, April 28, June 7, 1942.

SEATTLE PLANT

New Construction:

Twenty-five destroyers for U. S. Navy.

TODD-CALIFORNIA SHIPBUILDING CORP.
Richmond, Calif.

New Construction:

Thirty cargo vessels for British Purchasing Commission. Cost $50,000,000.

TODD-SEATTLE DRY DOCKS
Seattle, Wash.

Conversion work.

WESTERN BOAT BUILDING CO., INC.
Tacoma, Wash.

New Construction:

Hull No. 144, U. S. S. Phoebe, coast mine sweeper. Completion date, May 1, 1941.

Hull No. 145, Anna M., live bait tuna boat. Lauching date, April 5, 1941.

Conversion:

Fishing boats Majestic and Mahree Star, conversion to naval use.

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Shipbuilding and Drydock
Corporation

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Repair Facilities

Drydocking and
Machinery Repairs

Builders of
MERCHANT AND NAVAL VESSELS

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Cable Address:
"LASHIPCO"

WESTERN PIPE AND STEEL CO.
South San Francisco, Calif.

New Construction:

Hulls Nos. 58-61, four C-1 cargo vessels for U. S. Maritime Commission. Full scantling diesel propulsion type; single screw; two Busch - Sulzer 2100-hp engines. **Delivery dates, March 17,** May 16, July 15 and September 13, **1941.**

Hulls Nos. 62-65, four C-3 cargo ships for U. S. Maritime Commission. 492′ x 69′ x 42′6″; 8900 tons; 8500-hp; steam propulsion; $2,990,000 each. Keel laying dates, February 28, May 5, August 1 and September 30, 1941. Launching dates July 15, September 15, December 5, 1941, and January 15, 1942. Delivery dates, February 24, May 5, May 15 and June 24, 1942. All above dates estimated.

Navy life floats.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY
Pittsburgh, Pa.

New Construction:

Ten freight barges for Inland Waterways Corp., St. Louis, Mo. 280′ x 48′ x 11′.

Eight dump scows. 160′ x 50′6″ x 13′6″; for Panama Canal.

Two fueling scows for Carnegie Illinois Steel Co. 125′ x 26′ x 11′.

THE AMERICAN SHIP BUILDING CO.
Cleveland, Ohio

New Construction:

Twelve net tenders for U. S. Navy; (6 at Lorain, Ohio; 6 at Cleveland, Ohio). 151′8″ x 30′6″ x 16′6″; diesel-electric propulsion; contract price $6,357,000.

Four diesel trawlers for General Seafoods Corp. 146′8″ L. O. A. x 26′0″ x 14′4″. (2 at Lorain, Ohio; 2 at Cleveland, Ohio.) Delivery date, November 15, 1941.

BATH IRON WORKS
Bath, Maine

New Construction:

Hulls Nos. 182-183, DD437, Woolsey; and DD438, Ludlow; two 1620-ton destroyers for U. S. Navy. **No. 183 delivered March 5, 1941.** Delivery date No. 182, July, 1941.

Hulls Nos. 184-187, four cargo ships for American Export Lines. 400′ x 60′ x 39′. Delivery dates September and October, 1941, and April and June, 1942.

Hulls Nos. 188-189, DD457 and DD458, two destroyers for U. S. Navy. Delivery dates December, 1941, and February, 1942.

Hulls Nos. 190-195, DD449-451, 467-469, six destroyers for U. S. Navy.

Hulls Nos. 196-206, DD507-DD517, eleven destroyers for U. S. Navy.

Hulls Nos. 208-213; DD629-DD631; DD 642-DD644; six destroyers for U. S. Navy.

BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Division

Fore River Yard

Quincy, Mass.

New Construction:

Hull No. 1478, Massachusetts, 35,000-ton battleship for U. S. Navy. Keel laid July 20, 1939.

Hulls Nos. 1479, San Diego; and 1480, San Juan; two 6000-ton cruisers for U. S. Navy. Keels laid March 27 and May 15, 1940.

Hull No. 1484, cargo vessel for U. S. Maritime Commission. 450′ x 66′ x 42′3″; 16½ knots; geared turbines and water tube boilers; 14,500 tons. Launching date November 16, 1940.

Hulls Nos. 1485-1487, three tankers. 502′ x 68′ x 37′; 21,000 tons. Keels laid July 1, August 7 and September 26, 1940.

Hulls Nos. 1488-1491, four tankers for Sinclair Refining Co., 10,700 tons dwt. Keel laid, No. 1488, November 21, 1940.

Hulls Nos. 1492-1493, two tankers for Sinclair Refining Co. 15,450 tons dwt.

Hulls Nos. 1494-1497, four heavy cruisers for U. S. Navy.

Hulls Nos. 1498-1501, four light cruisers for U. S. Navy.

Hulls Nos. 1502-1503, two light cruisers for U. S. Navy.

Hulls Nos. 1504-1507, four heavy cruisers for U. S. Navy.

Hulls Nos. 1508-1511, four aircraft carriers for U. S. Navy.

Hulls Nos. 1512-1515, four trawlers.

Hulls Nos. 1516-1519, four 1650-ton destroyers for U. S. Navy.

BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Division

Sparrows Point Yard

Sparrows Point, Md.

New Construction:

Hulls Nos. 4341, Robin Locksley; 4342, Robin Doncaster; 4343, Robin Kettering; three cargo vessels for Seas Shipping Co. LOA 485′, beam 66′, draft 43′. Launching dates, No. 4341, October 5, 1940; No. 4342, December 7, 1940; No. 4343, January 18, 1941. **Delivery date, No. 4342, March 5, 1941.**

Hulls Nos. 4346, Thompson Lykes; 4347-4348; three C-1 cargo vessels. LOA 417′, LBP 395′, beam 60′, depth 37′6″. Launching date, No. 4346, December 21, 1940. **Delivery date, No. 4347, March 8, 1941.**

Hulls Nos. 4350-4352, three cargo vessels for Seas Shipping Co. 450′ x 66′ x 34′; 6300 hp; 8500 gross tons.

Hulls Nos. 4353-4356, four oil tankers for Socony Vacuum Oil Co. 487′6″ x 68′ x 37′; 12,000 hp; 9800 gross tons.

Hull No. 4357, oil tanker for Union Oil Co. of Calif. 442′ x 63′ x 34′10″; 3500 hp; 8000 gross tons.

Hulls Nos. 4358-4359, two oil tankers for Socony Vacuum Oil Co. 487′6″ x 68′ x 37′; 12,000 hp; 9800 gross tons.

Hulls Nos. 4360-4361, two oil tankers for Union Oil Co. 442′ x 64′ x 34′10″; 3500 hp; 8000 gross tons.

Hulls Nos. 4362-4364, three cargo and passenger vessels for Mississippi Shipping Co. 465′ x 65′6″ x 39′9″; 8600 hp; 8300 gross tons.

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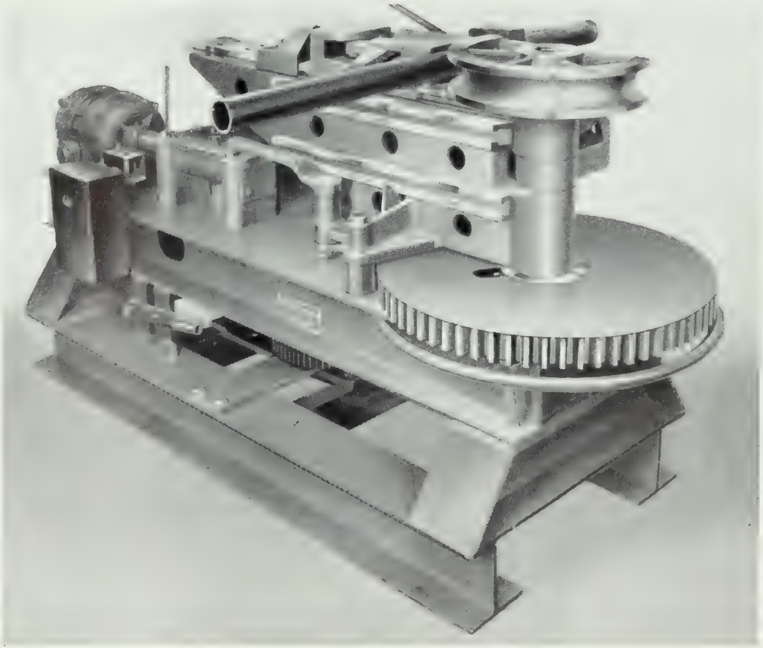

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Hull No. 4365, oil tanker for Richfield Oil Co. 442' x 64' x 34'10"; 3500 hp; 8000 gross tons.

Hulls Nos. 4367-4368, two oil tankers for Panama Transport Co. 487'6" x 68' x 37'; 7000 hp; 9800 gross tons.

Hull No. 4369, oil tanker for Continental Oil Co. 442' x 64' x 34'10"; 3500 hp; 8000 gross tons.

Hulls Nos. 4371-4372, two oil tankers for Gulf Oil Co. 442' x 64' x 34'10".

Hull No. 4373, tanker for Panama Transport Co. 487'6" x 68' x 37'; 7000 hp; 9800 gross tons.

Hulls Nos. 4374-4375, two tankers for Union Oil Co. of Calif. 487'6" x 68' x 37'; 7000 hp; 9800 gross tons.

BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Division
Staten Island Yard
Staten Island, N. Y.

New Construction:

Hulls Nos. 8016-8019, four C-1-B design cargo vessels for U. S. Maritime Commission. 417'9" x 60' x 37'5". **Launching dates, No. 8018, March 13, 1941; No. 8019, April 15, 1941. Delivery dates, March 25, June 1,** August 15 and October 1, 1941.

Hulls Nos. 8021-8022, two destroyers for U. S. Navy.

Hulls Nos. 8023-8029; 8033-8035; ten destroyers for U. S. Navy.

IRA S. BUSHEY & SONS, INC.
Brooklyn, N. Y.

New Construction:

Hull No. 486, tug. 100'; 805-hp F-M diesel. Delivery date, May, 1941.

Hull No. 490, tug. 90'; 805-hp F-M diesel. Delivery date, July, 1941.

Hull No. 491, wooden drydock section for Bethlehem Steel Co. **Delivery date, April 15, 1941.**

Hull No. 493, tug. 100'; 805-hp F-M diesel. Delivery date, May, 1941.

Hull No. 494, tug. 90'; 805-hp F-M diesel. Delivery date, July, 1941.

Hull No. 496, tug. 90'; 805-hp F-M diesel.

Hull No. 497, tug. 90'; 805-hp F-M diesel.

Hull No. 498, 156-foot oil tanker.

Hull No. 499, 156-foot oil tanker.

Hull No. 500, wooden drydock section for Bethlehem Steel Co.

CRAMP SHIPBUILDING COMPANY
Philadelphia, Pa.

New Construction:

Six cruisers, Cleveland class, for U. S. Navy.

DEFOE BOAT & MOTOR WORKS
Bay City, Mich.

New Construction:

Hull No. 167, PC452, sub-chaser for U. S. Navy. 174' long. Delivery date, May, 1941.

Hulls Nos. 168 - 170, YT149 - YT151, three harbor tugs for U. S. Navy. 100' long. Delivery date, May 1, 1941.

Hulls Nos. 171-174, four mine sweepers for U. S. Navy, 220' long.

Twelve 165-foot escort vessels for U. S. Navy.

THE DRAVO CORPORATION
Engineering Works Division
Pittsburgh, Pa., and Wilmington, Del.

New Construction:

Hulls Nos. 1700-1701, two welded carfloats for Pennsylvania R. R., Philadelphia, Pa. 250' x 34' x 9'1"; 1188 gross tons.

Hulls Nos. 1748-1749, two type W-7 welded coal barges for stock. 175' x 26' x 10'8"; 944 gross tons.

Hull No. 1751, 760-hp twin-screw diesel towboat for stock. 145' x 27' x 11'9"; 318 gross tons.

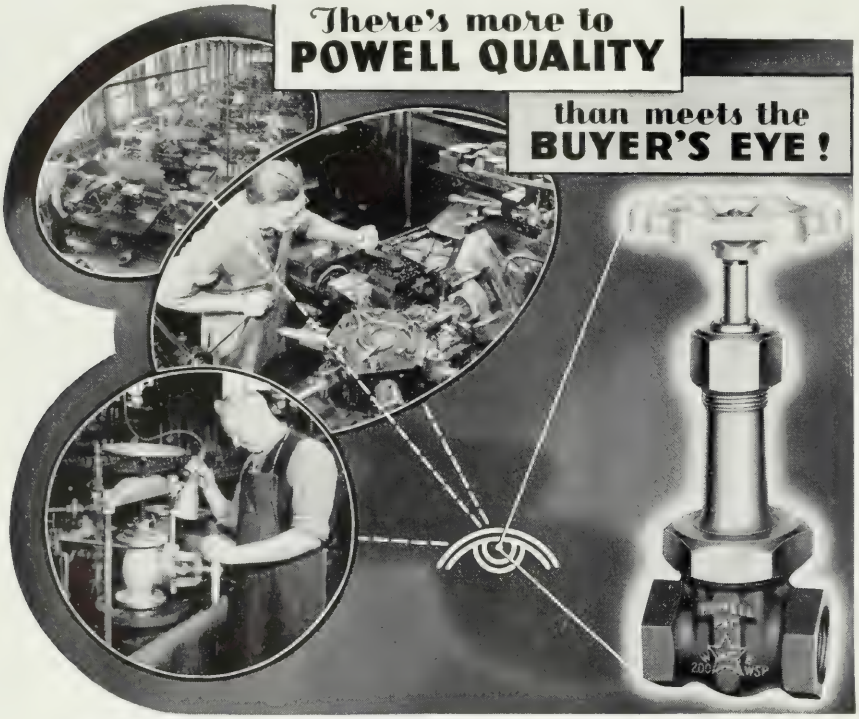
Hulls Nos. 1768-1775, 1846-1853, sixteen steel lighters for U. S. Navy Dept., Washington, D. C. 110' x 34' x 11'3"; 5344 gross tons.

Hulls Nos. 1776-1780, five covered cargo barges for stock. 175' x 26' x 11'; 2650 gross tons.

Hulls Nos. 1785 - 1790, six sand and gravel barges for Keystone Sand Division. 135' x 27' x 8'; 1530 gross tons.

Hulls Nos. 1791-1795, five covered cargo barges for stock. 175' x 26' x 11'; 2650 gross tons.

Hull No. 1796, deck barge for Arundel Corp., Baltimore, Md. 110' x 34' x 11'3"; 334 gross tons.



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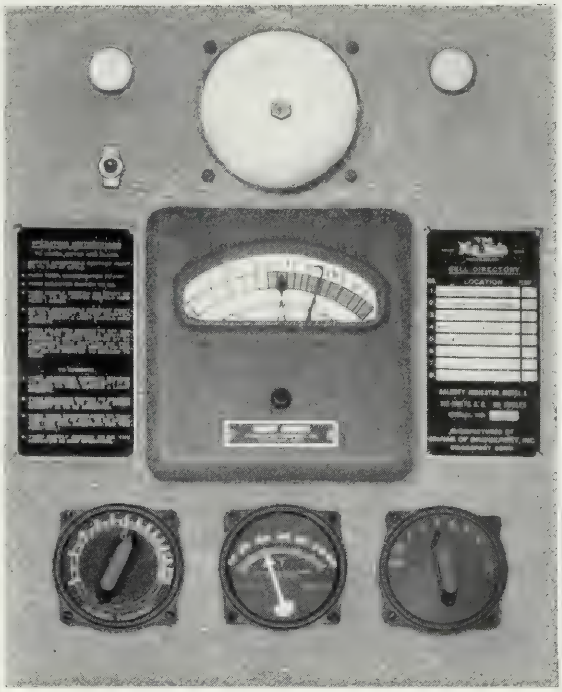

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Hulls Nos. 1797-1814, eighteen gate vessels for Bureau S. & A., Navy Dept., Washington, D. C. 5580 gross tons.

Hull No. 1815, one fabricated steel hull oil barge for Pacific D. D. & Repair, San Francisco, Calif. 195' x 35' x 9'9"; 598 gross tons.

Hulls Nos. 1816-1830, fifteen type W-7 welded steel bulk cargo barges for stock. 175' x 26' x 10'8"; 7080 gross tons.

Hulls Nos. 1831-1834, four welded steel oil barges for stock. 195' x 35' x 9'9"; 2392 gross tons.

Hulls Nos. 1835-1840, six escort vessels for U. S. Army, Washington, D. C. 2010 gross tons.

Hulls Nos. 1841 - 1845, five double-bottom covered cargo barges for stock. 175' x 26' x 11'; 2650 gross tons.

Hulls Nos. 1854-1855, two welded steel deck barges for Newport News S. B. and D. D. Co. 40' x 20' x 4'; 52 gross tons.

Hulls Nos. 1856-1861, six sand and gravel barges for Keystone Sand Division. 135' x 27' x 8'; 1530 gross tons.

THE FEDERAL SHIPBUILDING AND DRY DOCK COMPANY

Kearny, N. J.

New Construction:

Hulls Nos. 168-169, CL51, Atlanta; and CL52, Juneau; two 6000-ton cruisers for U. S. Navy. Keels laid April 22 and May 27, 1940.

Hulls Nos. 179-186, eight C-2 cargo ships for U. S. Maritime Commission. Keel laid, No. 179, December 27, 1940.

Hulls Nos. 187-188, two cargo vessels for Matson Navigation Co. Keels laid November 12 and 22, 1940.

Hull No. 189, one tanker for Pan American Petroleum and Transport Co. 13,000 dwt. tons. **Delivered March 4, 1941.**

Hulls Nos. 190-193, four tankers for Sinclair Refining Co. 15,000 dwt. Keel laid, No. 190, November 12, 1940.

Hulls Nos. 194-197, four destroyers for U. S. Navy. Keels laid, Nos. 194-195, December 2, 1940; Nos. 196-197, December 16, 1940.

Hulls Nos. 198-203, six destroyers for U. S. Navy.

Hulls Nos. 204-205, two destroyers for U. S. Navy.

Hulls Nos. 206-213, eight destroyers for U. S. Navy.

Hulls Nos. 214-218, five destroyers for U. S. Navy.

Hulls Nos. 219-221, three cruisers for U. S. Navy.

Hulls Nos. 222-227, six destroyers for U. S. Navy.

Hull No. 228, one C-2 cargo ship for U. S. Maritime Commission.

Hulls Nos. 229-230, two destroyers for U. S. Navy.

Hulls Nos. 231-232, two destroyers for U. S. Navy.

Hulls Nos. 233-240, eight cargo ships for the U. S. Maritime Commission.

GULFPORT BOILER & WELDING WORKS, INC.

Port Arthur, Texas

New Construction:

Hulls Nos. 167-168, two diesel-electric tugs for General Motors Corp. 100' x 24' x 12'4"; 1000 shp G. M. diesel and auxiliary each. **Delivery dates, No. 167, April, 1941;** No. 168, May, 1941.

Hull No. 176, diesel tug for General Motors Corp. 100' x 24' x 12'4"; 680 hp. Delivery date, July 30, 1941.

Hull No. 177, diesel tug for Deepwater Oil Terminals Co., Houston, Tex. 70' x 18' x 10'5"; 400 hp. **Delivery date, April 30, 1941.**

Hulls Nos. 181-184, four oil barges for Butcher-Arthur Corp., Houston, Texas. 150' x 28' x 8'.

Hulls Nos. 185-187, three oil barges for Butcher-Arthur Corp., Houston, Texas. 165' x 36' x 10'9".

Hull No. 189, diesel tug for General Motors Corp. 100' x 24' x 12'4"; 680 hp. Delivery date, August 30, 1941.

GULF SHIPBUILDING CORP.

Chickasaw, Ala.

New Construction:

Four 2100-ton destroyers for U. S. Navy.

Four vessels for Waterman Steamship Corporation. 445' x 63' x 40'6"; shelter deck type; geared turbine drive; 15½ knots service speed.

THE INGALLS SHIPBUILDING CO.

Pascagoula, Miss., and Decatur, Ala.

Pascagoula

New Construction:

Hulls Nos. 255-256; two C-3 cargo vessels. Completion dates, March and May, **1941.**

Hulls Nos. 268, 297-299, four C-3-IN passenger-cargo vessels for U. S. Lines. Completion dates, May, November, December, 1942; and February, 1943.

Hulls Nos. 265-267, three C-3-P passenger-cargo vessels for American-South African Line, Inc. Completion dates, November, December, 1941; and January, 1942.

Hulls Nos. 293-296, four C-3-S-A-2 cargo vessels for U. S. Maritime Commission. Completion dates, February, March, May and June, 1942.

Decatur

New Construction:

Hulls Nos. 304-306, three grain barges for Tennessee Valley Sand & Gravel Co., Sheffield, Ala. 175' x 26' x 11'.

Hull No. 307, oil barge for Stoll Oil Refining Company of Louisville, Ky. 195' x 35' x 9'9". **Delivery date, April 15, 1941.**

Hull No. 308, oil barge for Independent Oil Co., Dothan, Ala. 195' x 35' x 9'9".

Hull No. 309, landing barge for Government of Venezuela. 295' x 49'3" x 7'6"; barge No. 1.

Hull No. 310, landing barge for Government of Venezuela. 147'6" x 34'6" x 7'6"; barge No. 2.

Hull No. 311, landing barge for Government of Venezuela. 60' x 34'6" x 5'; barge No. 3.

Hull No. 312, ferry float and ramp for Government of Venezuela. 24' x 30' x 5'.

Hulls Nos. 313-314, two sand and gravel barges for stock, 110' x 26' x 6'6".

Hulls Nos. 315-317, three oil barges for Eddie Erlbacher, Cape Girardeau, Mo. 195' x 35' x 9'9".

Hulls Nos. 318-319, two deck barges for West Virginia Pulp and Paper Co., N. Y. 105' x 32' x 7'.

LEVINGSTON SHIPBUILDING CO.

Orange, Texas

New Construction:

Hull No. 160, tug for General Motors Corp. 85' x 22' x 9'; 800-hp diesel.

Hull No. 185, tug for U. S. Navy.

Hulls Nos. 187-188, 199, three tugs for River Terminals Corp. 85' x 23' x 9'6"; 600-hp Cooper-Bessemer engines.

Hull No. 190, tug for Sabine Towing Co., Port Arthur, Texas. 74' x 20' x 9'; 400-hp diesel.

Hull No. 191, barge for U. S. Navy.

Hulls Nos. 192-193, two 8600-bbl barges for stock.

Hulls Nos. 194-195, two tugs for stock. 66' x 17' x 7'7".

Hull No. 196, tug for stock. 74' x 20' x 9'; 400-hp diesel.

Hulls Nos. 197-198, two 10,000-bbl stock barges (oil).

Hull No. 200, 8600-bbl barge for stock.

Hull No. 201, tug for stock. 74' x 20' x 9'; 400-hp Atlas diesel.

MANITOWOC SHIP BUILDING CO.

Manitowoc, Wis.

New Construction:

One steel twin-screw carferry. 406' x 57' x 23'6'. **Delivery date, March 12, 1941.**

JOHN H. MATHIS CO.

Camden, N. J.

New Construction:

Four anti-submarine net tenders for U. S. Navy.

One bulk carrier tanker 265' long for Thos. Bowes, N. A.

NEWPORT NEWS SHIPBUILDING & DRYDOCK CO.

Newport News, Va.

New Construction:

Hull No. 372. Sold to U. S. Navy for conversion to naval auxiliary. Gross tonnage about 11,500 tons; LBP 525', breadth molded 75', depth molded 39'. Launched September 18, 1940.

Hull No. 378, battleship 58, Indiana, for U. S. Navy. Keel laid November 20, 1939.

Hulls Nos. 382-384, three single screw combination passenger and cargo vessels for U. S. Maritime Commission. 465' x 69'6" x 42'6"; gross tonnage about 9100 tons. **Delivery dates, No. 382, March, 1941;** No. 383, June, 1941.

Hull No. 385, aircraft carrier No. 8, Hornet, for U. S. Navy. Launched December 14, 1940.

Hull No. 386, single-screw combination passenger and cargo vessel for U. S. Maritime Commission. 465' x 69'6" x 42'6"; gross tonnage about 9100 tons. Delivery date, October, 1941.

Hulls Nos. 387-388, two single-screw cargo vessels for Matson Navigation Co. 465' x 69'6" x 42'6"; gross tonnage about 7700. Delivery dates, May 25 and July 1, 1941.

Hull No. 389, one single-screw cargo vessel for International Freighting Corp., Inc. 435' x 63' x 40'6"; gross tonnage about 8000. Delivery date, August 1, 1941.

Hulls Nos. 390-391 (CL62-CL63), two light cruisers for U. S. Navy.

Hulls Nos. 392-394 (CV9-CV11), three aircraft carriers for U. S. Navy.

Hulls Nos. 395-398 (CV12-CV15), four aircraft carriers for U. S. Navy.

Hulls Nos. 399-400 (CL80-CL81), two light cruisers for U. S. Navy.

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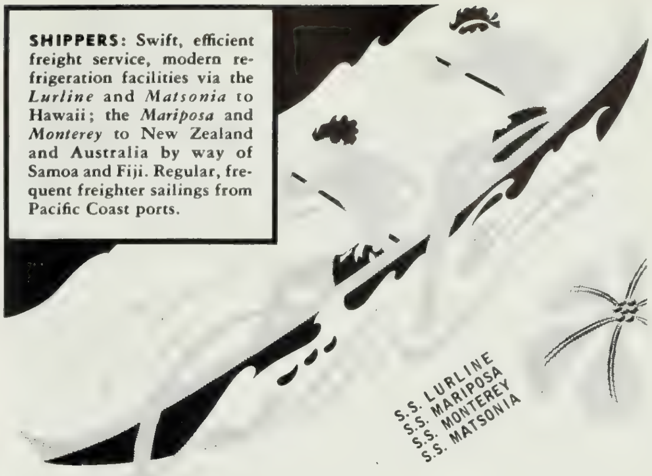

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THE NEW YORK SHIPBUILDING CORPORATION
Camden, N. J.

New Construction:

BB57, South Dakota, battleship for U. S. Navy. Keel laid July 5, 1939.

AR5, Vulcan, repair ship for U. S. Navy. Keel laid December 26, 1939.

CL55, Cleveland; and CL56, Columbia; two cruisers for U. S. Navy. Order placed March 23, 1940.

CL57 and CL58, two cruisers for U. S. Navy. Order placed June 12, 1940.

AV7, Currituck, seaplane tender for U. S. Navy.

CL59-CL61, three cruisers for U. S. Navy.
CB1-CB6, six cruisers for U. S. Navy.
CL76, four cruisers for U. S. Navy.

THE PUSEY & JONES CORP.
Wilmington, Del.

New Construction:

Hull No. 1076, C-1 cargo vessel for U. S. Maritime Commission; 413′ x 60′ x 37′6″; 5000 gross tons; turbine propulsion; 4000 hp; 14 knots speed. **Delivery date, March, 1941.**

Hulls Nos. 1080-1081, two automobile and passenger ferries for Delaware-New Jersey Ferry Co. 206′ x 65′ x 16′; 750 gross tons; Una-Flow steam machinery; 1400 shp; 15 mph speed. Launching date, February 1, 1941.

Hulls Nos. 1082, Hains; and 1083, Hoffman; two seagoing hopper dredges for War Dept., U. S. Engineers Office, Philadelphia, Pa. 215′10½″ x 40′ x 15′6″; approx. 2000 gross tonnage; diesel-electric propulsion, 950 shp. Delivery dates, February and August, 1942.

SUN SHIPBUILDING AND DRY DOCK COMPANY
Chester, Pa.

New Construction:

Hulls No. 186, Rio Hudson; No. 187, Rio Parana; No. 188, Rio de la Plata; No. 189, Rio de Janeiro; four C-3 cargo and passenger liners for Moore-McCormack Lines. 492′ x 69′6″ x 42′6″; 8500 gross tons; diesel propelled; 8500 shp; 16½ knots. Delivery dates, August, Stepember, October and November, 1941.

Hulls Nos. 199-206, eight C-2 cargo vessels for U. S. Maritime Commission. 474′ x 63′ x 40′6″; 7400 gross tons; diesel propelled; 7500 shp; 16 knots. Launching dates, No. 199, May 10; No. 200, June 21; No. 201, July 21; No. 202, September 6; No. 203, October 4; No. 204, November 11, 1941; Nos. 205-206, 1942. Delivery dates, No. 199, July; No. 200, August; No. 201, September; No. 202, November; No. 203, December, 1941; Nos. 204-206, 1942.

Hull No. 207, Esso Williamsburg, tanker for Panama Transport Co. 547′3″ x 70′ x 40′; 11,300 gross tons; diesel propelled; 7500 shp; 15 knots. **Delivery date, April, 1941.**

Hulls Nos. 208-210, three tankers for Petroleum Shipping Co. 520′ x 68′ x 37′; 10,400 gross tons; turbine; 4000 shp; 13 knots. **Launching dates, No. 208, March 29;** No. 209, June 7; No. 210, July 7, 1941. Delivery dates, No. 208, May; No. 209, August; No. 210, September, 1941.

Hull No. 211, tanker for Atlantic Refining Co. 543′10″ x 70′ x 40′; 11,600 gross tons; turbo-electric; 500 shp; 13 knots. **Delivery date, April, 1941.**

Hull No. 212, tanker for Sun Oil Co. 547′3″ x 70′ x 40′; 11,300 gross tons; diesel propelled; 7500 shp; 15 knots. **Delivery date, March, 1941.**

Hulls Nos. 213-216; 219-220, six tankers for Panama Transport Co. 547′3″ x 70′ x 40′; 11,400 gross tons; 7500 shp; 15 knots speed. Launching and delivery dates, 1942-1943.

Hulls Nos. 217-218, two tankers for Standard Oil Co. of N. J. 547′3″ x 70 x 40′; 11,400 gross tons; 7500 shp; 15 knots speed. Launching dates, No. 217, August 19; No. 218, October 18, 1941. Delivery dates, No. 217, October; No. 218, December, 1941.

Hulls Nos. 221-222, two tankers for Keystone Tankship Corp. 520′ x 68′ x 37′; 10,600 gross tons; turbine; 12,000 shp; 16½ knots. Keel laying dates, November 15 and December 15, 1941. Launching dates, No. 221, November 22, 1941; No. 222, 1942. Delivery dates, No. 221, January, 1942; No. 222, 1942.

Hulls Nos. 223-225, three tankers for The Texas Co. 513′10″ x 68′ x 36′; 9300 gross tons; turbine; 9000 shp; 16 knots. Launching and delivery dates, 1942.

Hull No. 226, tanker for Kaymar Tankship Corp. 520′ x 68′ x 37′; 10,600 gross tons; turbine; 12,000 shp; 16½ knots. Keel laying date, 1942.

Hulls Nos. 227-228, two tankers for Seamar Tankship Corp. 520′ x 68′ x 37′; 10,600 gross tons; turbine; 12,000 shp; 16½ knots. Keel laying dates, 1942.

Hull No. 229, tanker for Atlantic Refining Co. 543′10″ x 70′ x 40′; 11,600 gross tons; turbo-electric; 5000 shp; 13 knots. Launching date, August 4, 1941. Delivery date, October, 1941.

Hull No. 230, tanker for Atlantic Refining Co. 474′ x 65′ x 37′; 8000 gross tons; turbo-electric; 5000 shp; 14½ knots. Launching date, December 6, 1941. Delivery date, 1942.

Hulls Nos. 231-232, two tankers for Keystone Tankship Corp. 520′ x 68′ x 37′; 10,600 gross tons; turbine; 12,000 shp; 16½ knots. Delivery date, 1942.

Hulls Nos. 233 and 240, two tankers for Gulf Oil Corp. 485′ x 68′ x 36′; turbine propelled; 14½ knots. Delivery dates, December, 1942, and March, 1943.

Hull No. 234, tanker for Sun Oil Co. 547′3″ x 70′ x 40′; 11,400 gross tons; diesel propelled; 7500 shp; 15 knots. Delivery date, 1942.

Hulls Nos. 235 and 237, two tankers for Standard Oil Co. of N. J. 547′3″ x 70′ x 40′; 11,400 gross tons; turbine; 7500 shp; 15 knots. Delivery date, 1942.

Hull No. 236, tanker for Atlantic Refining Co. 543′10″ x 70′ x 40′; 11,600 gross tons; turbo-electric; 5000 shp; 13 knots. Delivery date, 1942.

Hulls Nos. 238-239, two tankers for Standard Oil Co. of Calif. 521′ x 70′ x 40′; turbine propelled; 15½ knots. Delivery dates, January and March, 1943.

TAMPA SHIPBUILDING CO.
Tampa, Fla.

New Construction:

Hull No. 36, C-2 type cargo vessel for U. S. Maritime Commission. 459′ x 63′ x 31′6″; 9291 dwt tons; diesel powered. **Delivery date, March, 1941.**

Hulls Nos. 37-40, four C-2 type cargo vessels for U. S. Maritime Commission. 459′ x 63′ x 31′6″; 9291 dwt tons.

TODD-BATH SHIPBUILDING CORP.
Bath, Maine

New Construction:

Thirty cargo vessels for British Purchasing Commission. Cost $50,000,000.

Two Ore Freighters

(Continued from page 72)

bulk freighters. Normal power will be 4,000 shp at 90 rpm and maximum power 4,400 shp at 93 rpm. General dimensions of the new vessels will be as follows: 640′ overall length, 614′ keel length, 67′ beam, 35′ depth, maximum loaded draft 23′10″, loaded speed in deep water about 13 miles per hour at maximum draft. Maximum single cargo capacity about 17,500 tons.

Main drive will be double reduction gear steam turbine. Steam pressure will be 400 psi with total steam temperature of 750° F. at the throttle and 28½ inch vacuum.

Steam will be furnished by two water tube boilers designed for 450 psi and fitted with inter-deck superheaters, air preheaters, water side walls and mechanical spreader type stokers for coal firing.

Full automatic combustion control will be used.

Auxiliaries and deck machinery will be electrically driven from power furnished by two 325-kw turbo-generators having same steam conditions as main unit.

Cape Cod Launched at Staten Island

Mrs. Lindsay C. Warren, wife of the Comptroller General of the United States, of Washington, North Carolina, christened the S.S. Cape Cod as she was launched at 8:20 A.M., Thursday, March 13, at the Staten Island yard of the Bethlehem Steel Company.

Cape Cod is the twenty-seventh C-1 cargo vessel to be launched in the Commission program and is one hundredth of the vessels in the over-all program for replacing the obsolete vessels in the United States merchant fleet.

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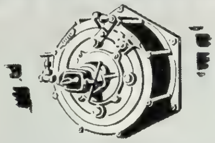

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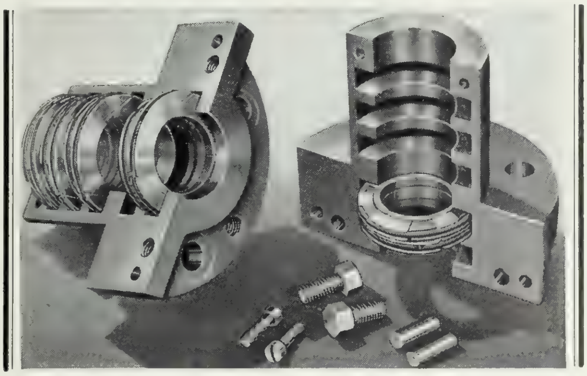

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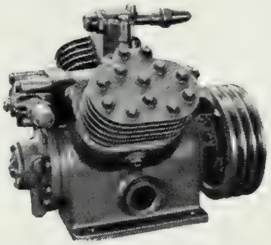

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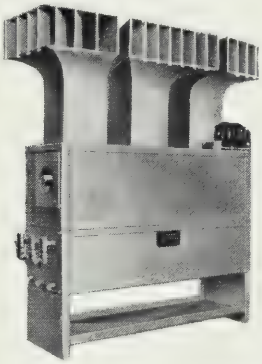

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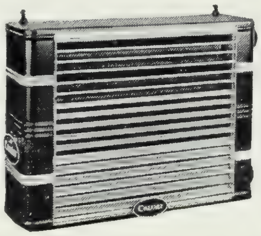

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The Catalogs of Today Become the Technical Handbooks of Tomorrow

Pendulum Window Wiper, a four-page folder issued by the Kearfott Engineering Co., Inc., describes and illustrates the Kearfott pendulum-type, "Seagoing" window wiper.

The wiper, installed with either AC or DC motors, is manufactured for non-corrosion by use of bronze and stainless materials; for lasting qualities, by rugged construction and encasement to protect the mechanism from contact with salt water.

Many other advantages are discussed in the text.

"Caterpillar" Condensed Catalog, 1941, a 36-page booklet illustrates and briefly describes the complete line of the Caterpillar Tractor Co.

Seven pages are devoted to diesel marine engines and diesel electric sets, all models manufactured by the company.

Hycar Synthetic Rubbers, an excellent eight-page booklet on the new Hycar group of synthetic rubbers, manufactured by the Hydrocarbon Chemical and Rubber Company, is now available upon request to the manufacturer and is of interest to everyone interested in the general subject of synthetic rubber. The booklet is written in non-technical language, easily understood by those not directly in the rubber field.

Hydrocarbon Chemical and Rubber Company was jointly formed last year by The B. F. Goodrich Company and the Phillips Petroleum Company.

The booklet relates how the Hycar type of synthetic rubber is handled like natural rubber, describes the physical characteristics of Hycar O. R., an oil resistant type of synthetic rubber, lists the comparative properties of Hycar O. R. and natural rubber and pictures some of the steps in the manufacture of Hycar.

Improved Proportioning Equipment, a new 8-page bulletin describing the latest developments in proportioning and sampling equipment, issued by D. W. Haering & Co., Inc. Construction, operation and application of the new and improved Nelson Chemical Proportioning Pump are discussed. This is the synchronized drive chemical pump which has gained wide favor in the solution of proportioning problems in the petroleum and water conditioning industries.

The Fluid Piston Principle, basis of the popular Model "B" Feeder and all Haering Proportioning and Sampling Machines, is explained and thoroughly discussed with reference to design, construction and operation of these machines.

"Caterpillar" Precision, a 40-page illustrated booklet about precision manufacturing methods, which has just been issued by Caterpillar Tractor Co., presents a clear view of the care and accuracy necessary to produce machines that meet the company's rigid standards.

"Caterpillar's" instruments and methods—many of which are photographed and publicized for the first time—work to within a few millionths of an inch of absolute accuracy. The machines and gages which are necessary for this kind of production are discussed and photographed.

Superfinishing of crankshafts, gear manufacturing to one ten-thousandth of an inch of accuracy, pre-testing of steels, track link accuracy, chromium plating twenty times as thick as that used for decoration, and numerous other "Caterpillar" practices are described. A chapter is devoted to metal hardening by high frequency induction. Foundry practices and the maintenance of welding quality are among the other things discussed.

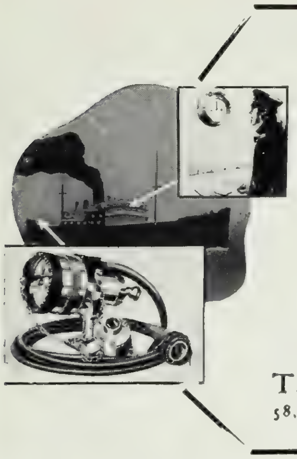
The two-color booklet is profusely illustrated, and is written in easy-to-understand language, with technical terms avoided wherever possible.

Gas Cutting Machines for Marine Construction, a new 26-page bulletin, issued by Air Reduction, has been published to make available convenient descriptions of the various newly-developed machines for aiding fabrication welding in the marine industry. Illustrative photographs display each of the machines and their functions in detail.

The machines described are the Airco No. 1 Planograph, No. 10 Planograph, No. 10 Polygraph, No. 4 Radiagraph, No. 10 Radiagraph, Nos. 40 and 41 Travographs and Nos. 10 and 20 Beamographs. All are motor-driven gas cutting machines serving essential functions in marine applications—some for portable, some for stationary use. The bulletin describes these functions, explaining the use of the Nos. 4 and 10 Radiagraphs for cutting straight lines, arcs and circles and combinations of the two. A section is devoted to templet cutting, plate edge preparation and flame machining, special operations which can be performed with these machines when simple attachments are used.

* * *

Mogul Steel, a new 12-page booklet which describes Jessop's Mogul molybdenum tungsten high speed steel, has



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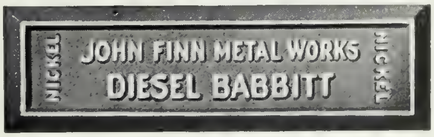

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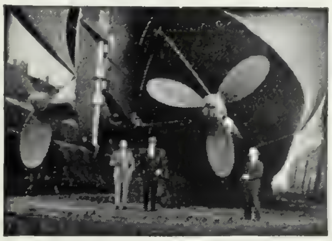

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just been published by the Jessop Steel Co.

This brochure describes the advantages of Mogul over 18-4-1 high speed steels, including lower initial cost of steel, lower heat treating costs, and longer tool life on many jobs. A description of the physical properties of Mogul, approximate analysis, hardness values at varying drawing temperatures, and complete heat treating procedure are enumerated.

Hot Process Softeners, a new 48-page catalog, Publication No. 3000 of the Cochrane Corporation, Philadelphia. This book contains a nine-page appendix of feed water chemistry, in addition to heat balances, flow diagrams, two-color construction drawings and engineering tables and charts. Effective treatments for all water conditions are discussed. Various types of installations are diagrammed, and considerable space is devoted to illustrations and descriptions of accessory equipments and their various functions.

The text provides a basis for selecting the proper method of feed water conditioning that will be most suitable and economical for any given plant.

Engineering Properties of Iconel, a 16-page 1941 revision of Technical Bulletin T-7 of the International Nickel Company, Inc.

This pamphlet contains revised information on mechanical properties at ordinary and at elevated temperatures.

One table summarizes the mechanical property ranges of standard products in accordance with the latest mill experience.

Another tabulation gives the minima requirements of the U. S. Navy Specification 47N1a, dated Sept. 1, 1938, for all products except seamless tubing. Minima values for tubing are given for Specification 49T13, dated Dec. 1, 1937. Mill shipments will be made in accordance with these minima properties when so specified.

New data for limiting service temperatures in different atmospheres are given in tabular form.

A graph gives useful curves for the approximate conversions for Brinell, Rockwell and Vicker's hardnesses.

The sections on Working Properties and Corrosion Resistance have been revised in accordance with the latest mill and field experiences.

A general description of all mill products has been added.

Single Stage Condensate Pump, Bulletin W-325-B1 of the Worthington Pump and Machinery Corporation.

A four-page brochure illustrated with drawings and half tones describing the single stage volute centrifugal pump especially designed for removing liquids from a high vacuum quietly and efficiently.

This pump as described is for electric motor drive and in one size having a 3" suction and 1½" discharge with capacities ranging from 10 to 100 gpm, a speed range of 1500 to 2500 rpm and a discharge head range of 50 to 110 feet.

Potentials of Metals and Alloys in Sea Water, by F. L. LaQue and G. L. Cox; ***Controlling Factors in Galvanic Corrosion,*** by W. A. Wesley. An authorized reprint of these two papers and the discussion evoked by the reading thereof at the 1940 meeting of the American Society for Testing Materials, published and distributed gratis by the International Nickel Company, Inc.

The first section is a very interesting 18-page booklet describing results of tests conducted by the International Nickel Company, Inc., at Wilmington, N. C., on the effect of sea water on various metals and alloys.

The second paper is a technical discussion of tests conducted on iron coupled with copper in a neutral sodium chloride solution.

C-E Marine Equipment—A 24-page catalog just issued by Combustion Engineering Company, Inc., New York, covering its line of steam generating equipment for marine service.

Included are boilers of the sectional-header, the two-drum bent-tube, and the three-drum straight-tube, or A, types; also, the C-E forced-circulation marine steam generator and the forced-circulation waste-heat boiler. The "Elesco" design of marine superheater and economizer, the C-E marine tubular air heater and the C-E marine-type spreader stoker are described.

The catalog is profusely illustrated with drawings and photographs showing details of the equipment described, and appended are shop views showing manufacturing operations in the fabrication and inspection of boilers at the Combustion Engineering shops.

Maritime Publications

Merchant Marine Conference, 1940, 112 profusely illustrated, 7½x 10½ pages on good book paper with heavy beige covers stamped in blue and gold. Published by the Propeller Club of the United States, 17 Battery Place, New York. Price, $1.00 net.

This interesting book contains all the speeches, addresses and discussions of the American Merchant Marine Conference held at New Orleans, Louisiana, December 8, 9, 10 and 11, 1940.

The addresses at this conference were given by recognized experts and covered practically every phase of American ship operation and the application of national policy thereto.

Students of merchant marine progress in America should keep a file of these annual publications in order to be informed on the year to year advance in national shipping policies.

The Motor Ship Reference Book, 1941, compiled by the staff of "The Motor Ship." Published by Temple Press, Ltd., Bowling Green Lane, London. $2.00. The seventeenth and completely revised edition of this annual reference book presents a review of motor ship progress, with many statistics to show the remarkable growth of the diesel marine drive. All the large oil-engined vessels in service are tabulated.

The book contains many illustrations and reproductions from photographs of big and small oil engines. The reader is helped to understand the methods by which ships' machinery has reached the highest known degree of efficiency and to appreciate the diverse character of the auxiliary plant which is part of the modern vessel's equipment.

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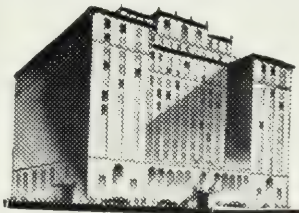

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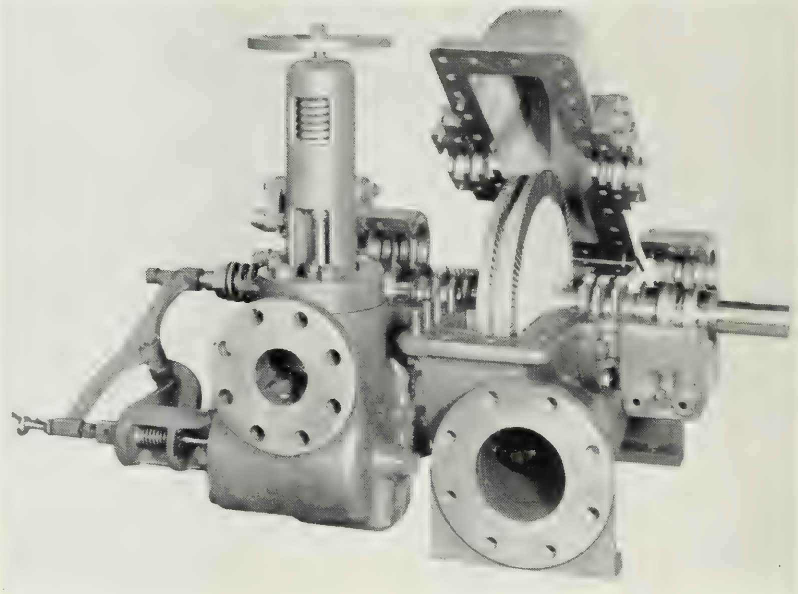

A combined trip and throttle valve has been designed and built into General Electric's improved Type D mechanical-drive turbines. This new valve will be a standard feature on Type D units, which are available in capacities from 5 to 2000 horsepower and in speeds from 1000 to 5000 rpm.

The new trip and throttle valve eliminates the shut-off previously required between steam piping and mechanical drive turbines. Positive protection against overspeeding is assured because the built-in valve shuts off all steam flow automatically before a dangerous speed is approached. A built-in reset valve makes restarting an easy matter.

An easily accessible Monel-metal, basket-type steam strainer around the trip and throttle valve prevents foreign material from entering the turbine and assures positive valve operation at all times.

During normal operation Type D turbine speed is controlled by a centrifugal-weight governor. The governing valve is of the balanced double-seated type with renewable valve seats. Low-friction bushings reduced inertia of the moving valve stem for accurate and quick-responding control.

General Electric's Type D mechanical-drive turbines are of the single-stage impulse type; each wheel carrying two rows of rotating buckets. Steam admission nozzles direct the initial steam flow to the first row of buckets. Stationary buckets reverse the steam path from the first row into the second row before it passes to exhaust. The Type D units may be arranged for either condensing or non-condensing operation with rotation in either direction.

Where continuous-duty drives are essential for driving circulating, condensate, and boiler-feed pumps, forced and induced draft fans, automatic stokers, mechanical-drive turbines have become particularly desirable because their operation depends only on the available supply of steam.

They also have important applications where dependable stand-by power is required for fire pumps, emergency boiler-feed pumps, exciters, and similar auxiliaries, because no preliminary warm-up is necessary and they can be put into service instantly.

Pacific
MARINE
REVIEW

MAY, 1941

MAIN PROPULSION REDUCTION GEAR DRIVE

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Farrel performance on ships of the United States Maritime Commission is backed by years of successful service on United States Navy fleet units.

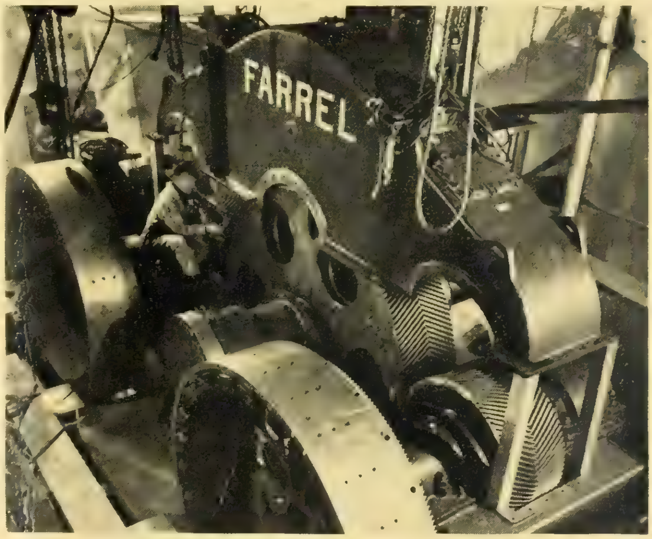
The motorship **American Manufacturer** is the first of five C-1 ships built at the Western Pipe & Steel Company, San Francisco. Two Busch-Sulzer Diesels, rated at 2160 bhp each for normal, continuous duty, drive a single screw through electro-magnetic slip couplings and a Farrel Reduction Gear Drive. The main propulsion gear unit is shown below with casing partially lifted during installation.

Increased cargo capacity was never at more of a premium than at this period of the world's history. Farrel Reduction Gear Drive provides **extra** cargo capacity amounting to an average of 50% of propulsion machinery weight necessary for direct drive of equivalent horsepower.

Farrel marine reduction gears concentrate the power of lighter, smaller engines in multiple units onto a single shaft without sacrificing most efficient propeller size and speed. The substantial savings in engine space and weight result directly in **extra** cargo carrying capacity, **extra** cruising range, or both.

Farrel Reduction Gear Drive eliminates unnecessary design compromises. With this type of drive propellers can be selected on the basis of hull form requirements without being limited in size or pitch by engine speed. Likewise, engine specifications can be established for most economical service without being limited by low propeller speed. The cumulative result is maximum efficiency for each with **extra** cargo capacity.

★



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Pacific MARINE REVIEW

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Official Organ

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Steamship Association**

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**Shipowners Association
of the Pacific Coast**

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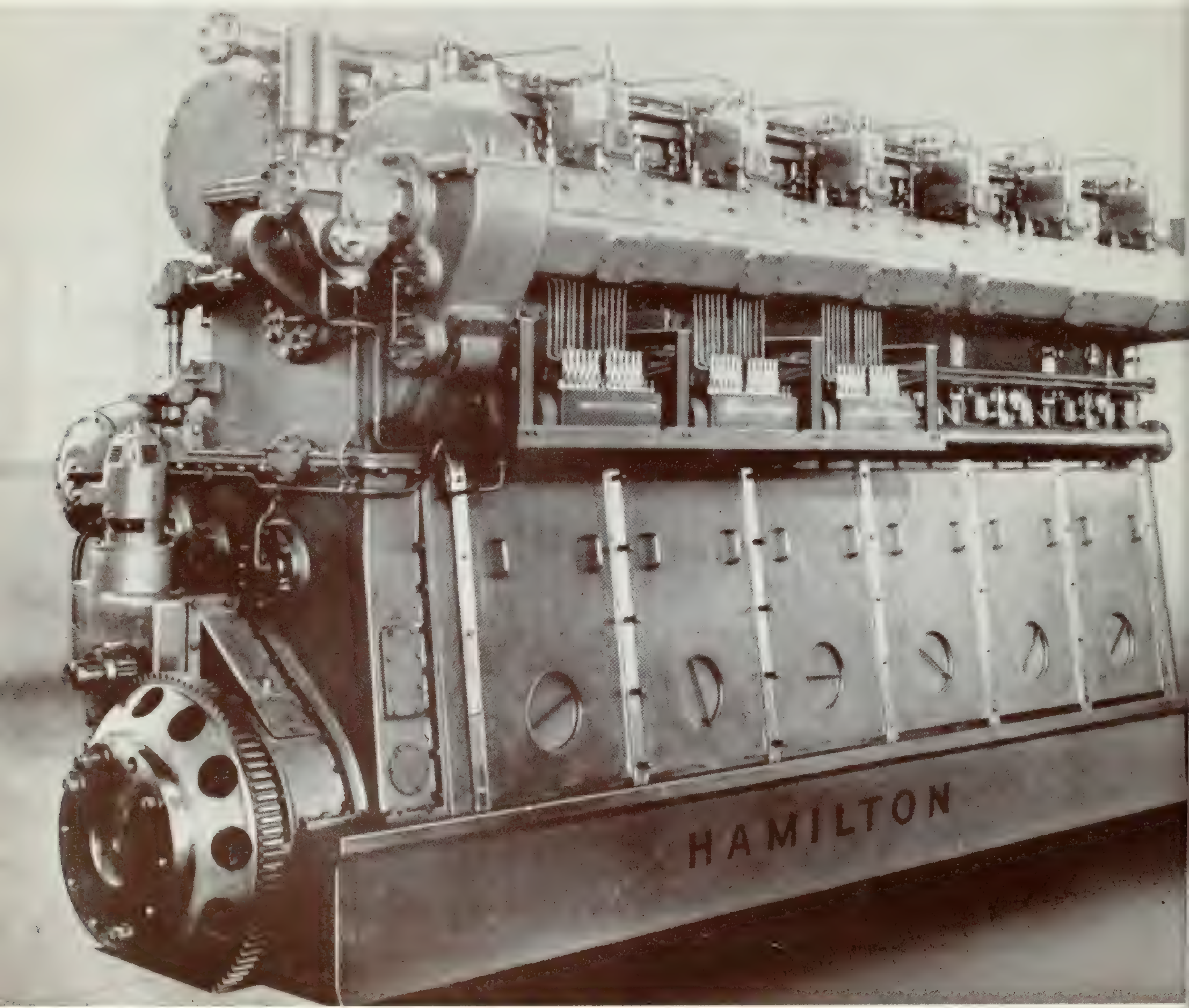
HAMILTON
DIESELS



HAMILTON
GENERAL MACHINERY CORPORATION
HAMILTON, OHIO
Hooven, Owens, Rentschler Division

Each vessel of the five C-1 Type Cargo Sh
which the Seattle-Tacoma Shipbuilding Co
ration is building for the United States Marit
Commission, will be equipped with a pair of
cylinder, two cycle, single acting, 21½" x 27
HAMILTON Diesels, rated at 2100 BHP
operating at 240 rpm. Each pair of main eng
will drive through Westinghouse reduction g
and Westinghouse electric couplings to one
peller shaft.

HAMILTON

Pacific MARINE REVIEW

Editorial Comment

Colossal Emergency Shipbuilding

As of April 18, there is allotted to the American shipbuilding industry the task of fabricating, erecting and equipping 444 emergency type ships and of building the shipyards in which to do the job.

This task would be quite a problem if it were the only work facing the industry, but coming as it does on top of the largest naval and mercantile shipbuilding program in American history, it is colossal.

Recognizing this fact, the U. S. Maritime Commission very wisely set up an emergency shipbuilding division and is keeping the emergency job entirely apart from its regular program of shipbuilding.

This emergency division, since January 1, 1941, has allocated to various contractors and shipbuilders the construction of seven new shipyards with a total of 56 ways, and the building of 312 emergency type cargo-carrying steamers having total deadweight of over 3,000,000 tons. In addition, it has allocated to one large Atlantic Coast shipyard the task of building 72 high-speed tankers with a total deadweight capacity of over 1,000,000 tons.

Add to this the British order for 60 cargo vessels with a total deadweight capacity of over 500,000 tons and we have a grand total of over 4,750,000 tons deadweight capacity, all ordered within the past four months from an industry that had every available facility occupied with active construction and reserved for at least a year ahead.

Rear Admiral Emory S. Land, chairman of the Maritime Commission, in a recent address, avers: "Today the United States is engaged in a supreme shipbuilding effort—an effort far more than twice as great as any ever before attempted in the history of this or any other country.

"Our shipbuilding today is in excess of $9,500,000,000 in value.

"We can handle this program, vast as it is. But any further expansion of shipbuilding in the United States will be done only at the expense of efficiency and economy and with delay in the delivery of the vessels now ordered and authorized.

"Any further dilution of shipbuilding brains . . . will result in gross waste and inefficiency."

L. H. Korndorff, President of the Federal Shipbuilding and Dry Dock Company, and one of the most experienced shipbuilders in America, in an address delivered April 16 last declares:

"At no time in its history has the American shipbuilding industry, as a whole, been in better position to serve the country efficiently, than it is today.

"The fact that shipyards have increased their forces by 600 per cent in a little over one year indicates a pretty substantial foundation.

"The program ahead of the industry must be considered colossal. Witness the 9 to 10 billions of dollars for shipbuilding today as compared with 3 billions for merchant ships and 2 billions for naval vessels in the last World War.

"The industry must increase its present force by 300 thousand men. Considering the demands of other defense industries, there will probably be a definite shortage of labor, which may require some allocation of man power.

"Urgency of demand for ships and their large proportion of the total Defense Program, should establish the highest possible priority rating for the shipbuilding industries until they get up to their production schedules. The shipyards will be able to receive and install machinery and equipment much faster than these items can be supplied at present."

M. S. American

First All Welded Sea Going Built on Pacific Coast

First of a group of C-1-B cargo motorships building at the South San Francisco yards of Western Pipe and Steel Company, the M. S. American Manufacturer sailed on her maiden voyage, April 20, from San Francisco under charter to the U. S. Army and bound for Hawaii and the Philippines with Army supplies.

Prior to her chartering, American Manufacturer had been put through a series of sea trials by the Trial Board of the U. S. Maritime Commission and had passed all tests satisfactorily before being delivered by the builders to her owners, the United States Lines, who will normally operate her on their Atlantic services.

Three of the four sisters to American Manufacturer have already been launched and christened respectively American Leader, American Builder and American Press. The fourth sister will be launched in the near future and will be christened American Packer.

These vessels are of the standard C-1-B design with general characteristics as shown in the table.

The hull has: a straight raked bow; a clean sheer fore and aft; a short three-deck superstructure, the forward bulkhead of which is almost exactly on the fore and aft midship line and a modified cruiser stern with nicely molded lines. All this gives the vessel that graceful, jaunty appearance which is kind to the eye and promises good seaworthiness and excellent maneuvering ability.

General Characteristics
C-1-B Motorships

Length O. A.		417′9″
Length B. P.		395′0″
Beam M.		60′0″
Depth M. main deck		37′6″
Draft F. L.		27′6″
Speed sustained sea		14 knots
S. H. P. normal		4000
Gross M. (approx.)		6839 tons
Net M. (approx.)		4100 tons
Fuel	1233 tons	
Crew, etc.	35 tons	
F. water	353 tons	
Cargo	7492 tons	
Total deadweight		9113 tons
Displacement		12,875 tons
Bale capacity		452,303 cu. ft.
Crew		43
Passengers		8

The main and second deck extend complete from stem to stern. A third deck extends from stern to forward bulkhead of machinery space, and from after bulkhead of machinery space to stern. This third deck is at the level of the top of shaft alley and forms deep tanks, port and starboard, for fuel oil and/or liquid cargo.

Seven water-tight bulkheads extend from the tank tops to the main or weather deck which thus becomes the freeboard deck. These bulkheads divide the hull into eight compartments designated from stem to stern as: forepeak, containing bosun's stores, chain locker and forepeak tank; No. 1 cargo hold; No. 2 cargo hold; No. 3 cargo hold; machinery space; No. 4 cargo hold; No. 5 cargo hold; and afterpeak, containing the steering room, carpenter shop, paint and lamp room and afterpeak tank.

Cargo Handling Facilities

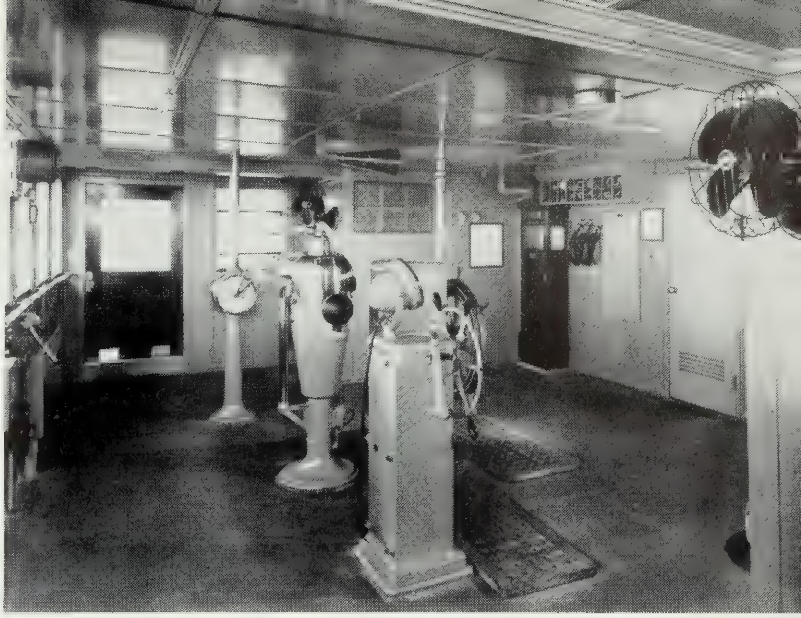
Hatches' cargo holds have the following dimensions: Numbers one and five, 20 feet beam by 27 feet length; and numbers two, three and four, 20 feet beam by 31 feet 6 inches length. These hatches are all fitted with pontoon type steel covers on the main deck and with wooden or metal-lumber covers on the second and third decks with the exception of number four hold which has oil-tight hatch covers over the four tanks below the third deck.

For cargo handling, all hatches are served by booms, three cargo masts and four king posts. At the bottom of each mast is an enclosed deck erection to house the hold ventilation fans and the resistors for the control of cargo winches. The king posts are located port and starboard, two at each end of the midship superstructure. Each king post serves one five-ton boom stepped at its base. Each mast serves four five-ton booms stepped two port and two starboard on the outboard bulkheads of the resistor houses. The house under No. 2 mast is equipped with step fittings for a 30-ton boom.

Each of the five-ton booms is served by an American Hoist & Derrick Company cargo winch which is driven by a 50 hp General Electric motor, and with a capacity to handle a single line load of 3300 pounds at a speed of 300 fpm, and of 6720 pounds at 220 fpm.

Manufacturer

Motorship



Pilot house of American Manufacturer

Two of these winches are compound geared to serve heavy weights, and each of these will handle a single-line load of 20,800 pounds at 75 fpm. Each winch is equipped with foot pedal and electric brakes. All are of the single drum type. The drums are 18 inches diameter by 20 inches long on the simple winches and 24 inches by 24 inches on the two compound winches. All winches have a gypsy head on an extension of the drum shaft.

Mounted on the main deck forward is a Markey Machinery Company anchor windlass of the horizontal shaft spur gear type with two wildcats and two whelpless 21″ gypsy heads on the main shaft. This windlass is driven by a 50 hp water-tight motor and has capacity to raise both anchors (17,600 lbs.) together with 30 fathoms of chain on each anchor (14,000 lbs.) simultaneously at a speed of 30 feet per minute. Baldt Di-Lok chain is installed and Baldt anchors.

A Markey Machinery Company 21 inch capstan of the vertical shaft spur and worm gear type is mounted on the main deck aft with its motor and reduction gear located in the steering gear compartment on the second deck. Powered by a 35 hp General Electric motor this capstan is capable of exerting a pull of 20,000 pounds at the rate of 30 fpm.

All holds are fitted with a mechanical ventilation system which takes air at the resistor-houses and forces it through the cargo spaces to the exhaust ducts that run up through the mast and the king posts. This system does away with unsightly ventilating cowls on deck and allows clear spaces for deck loads of lumber and other commodities. The fans and their motors are by Diehl.

Fire Protection

All cargo spaces are fitted with smoke detecting tubes on the Lux-Rich system. These tubes all lead to a cabinet in the pilot house which registers both visibly and audibly the slightest indication of smoke. All cargo spaces, engine room, emergency generator room, and lamp and paint room are protected by a Lux carbon dioxide fire extinguishing system with controls conveniently located on passageway bulkhead abreast the engine hatch trunk on the main deck and with the CO_2 cylinder room located in the engineer's stores space on the second deck level.

Accommodations

The living quarters for eight passengers, the officers and the crew are all located in the superstructure amid-

Pantry and short order kitchen

ships. Normal complement of crew and officers totals 43, divided into a deck department of 18, engine room department of 16 and a steward's department of nine.

The rooms on main deck level include: on the starboard side, seven staterooms housing the bosun and the carpenter, nine seamen, three wipers and four oilers, also toilets and showers; on the port side, three staterooms housing two cooks and six messmen, also a hospital, toilets and showers and four refrigerated stores chambers; amidships, forward end, crew's and petty officers' mess and recreation rooms, and the galley; and amidships aft, a large dry stores room.

On the cabin deck at the forward end amidships is a well-lighted dining saloon and lounge. Off this room open two double staterooms port and starboard. These four rooms are each equipped with private tiled bathroom and two large built-in lockers, and are tastefully furnished and decorated. A large pantry just aft of the dining saloon is equipped to take care of short orders and is connected by dumbwaiter with the galley just below.

Aft of the passengers' rooms on the port side are four rooms for engineer officers and chief engineer's suite, and on the starboard side, six rooms for three mates, the steward, the radio operator and two cadets. Amidship aft on this level are three rooms for the electrician, two spares and the ship's office.

On the bridge deck are the captain's suite and the chief mate's room.

Metal furniture and all bulkhead paneling, doors and joiner work in the accommodations on all five of these ships was furnished by the Aetna Sales Corporation (subsidiary of the Aetna Steel Products Corporation) and installed by Western Pipe & Steel Company. Paneling is all Johns-Manville Marinite with various metal or wood veneer faces. We noted among the many items of furnishing and equipment: chairs and tables by the Warren, McArthur Corporation; clocks by Seth Thomas; plumbing fixtures by Standard Sanitary Corp.; lockers by the Berger Manufacturing Division of the Republic Steel Corporation; mattresses, springs and metal beds by Simmons; and Oceanic wiring fixtures.

Ventilation and Heating

Mechanical ventilation is provided for all quarters through supply systems for each of the three decks, all originating in one fan room on the bridge deck level. Air is drawn from the outside through air filters by Diehl fans and blown through heaters or coolers into the various ducts. Zones in these ducts are provided with reheaters which are automatically controlled for specified room temperatures by Honeywell - Minneapolis temperature regulators. In some rooms individual Diehl circulating fans are installed.

Culinary Equipment

The all-electric galley on the main deck and the electric pantry on the cabin deck are modern stainless steel trim kitchens with tiled floors and are equipped with all the best culinary labor-saving devices that make it easy for the marine chef to prepare appetizing meals for crew and passengers—devices collected from all parts of the United States.

Among other items we noted: electric range by Lang Manufacturing Co., Seattle, Washington; coffee urns by T. J. Topper, San Francisco, California; vegetable peeler by Reynolds Electric Co., Chicago, Illinois; mixer by the Century Machinery Company, Cincinatti, Ohio; steam kettle by Wear - Ever Aluminum, Kensington, Pa.; warmers by Hobart, Troy, Ohio; and dumbwaiter by Kiesling, Brooklyn, New York. To supply these seven items, the Pacific Coast shipbuilders called on manufacturers of seven widely separated communities in six states, thus illustrating again the widespread benefits of a large shipbuilding program.

An electrical, stainless steel, tiled floor, modern galley takes care of the culinary needs

The lounge and dining saloon for passengers and officers is attractive and comfortable

Navigating Equipment

The pilot house of American Manufacturer, as in all U. S. Maritime Commission ship designs, is of ample area, and fitted with all of the most modern navigating equipment. The windows are by Kearfott Engineering Co., two of them being fitted with Kearfott electric window wipers so as to give clear vision on wet days. The ship telephone system is by Auto Telephone Co.

Sperry Gyroscope Company furnished the master gyro compass with repeaters at all steering stations; the automatic Gyro-Pilot with electric telemotor connections to the steering gear; the course recorder; and the rudder angle indicator.

The tell-tale board for the running lights, the revolution counter and the engine telegraph were furnished by the Bendix-Cory Corporation.

All radio communication equipment and the radio direction finder are by Radiomarine Corporation of America.

For echo depth soundings, the Submarine Signal Corporation installed a Fathometer.

The steering gear is of the double ram hydroelectric type built by Lidgerwood with duplicate hydraulic variable delivery pumps driven by duplicate 35 hp motors. Each motor and pump set has capacity to easily swing the rudder from hard over to hard over (70°), in 30 seconds when the hull is moving ahead full speed, and in 60 seconds when the hull is moving astern at her maximum astern speed.

Propulsion Machinery

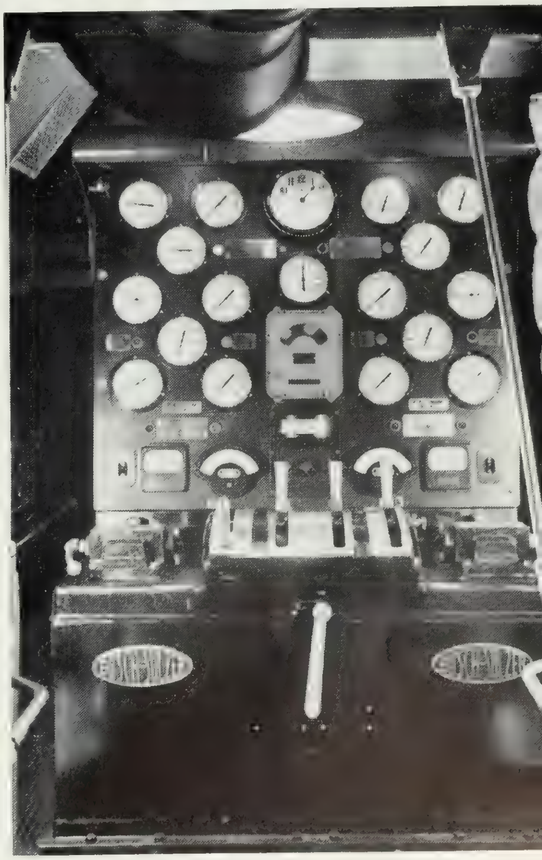
It is in the propulsion machinery that these vessels are most unique. Their main power plants consist of two diesel engines, each of which is connected through an electro dynamic coupling to one of the pinions of a single reduction gear set, the main gear of which is mounted on the main shaft driving the single propeller.

The main engines are Busch Sulzer, seven cylinder, direct reversing, two cycle, trunk piston, port scavenging, mechanical injection, marine diesel engines, with 19½″ bore and 27″ stroke. Each engine is rated 2125 shp at 240 rpm. Pistons are oil cooled, cylinders and cylinder heads cooled by fresh water. Both cooling oil and cooling water are re-cooled by salt water in Ross heat exchangers. Attached mechanisms included: fuel injection pumps; scavenging blowers; Woodward speed regulating and overspeed governors, indicator drives, revolution counters; thermometers; gages for pressure, lube oil and fuel oil; and turning gear.

Lubricating oil drains from the bearings into a sump tank under each engine. It is drawn from these sump tanks by the Quimby lube oil service pumps and discharged through Elliot strainers and Ross coolers to the distribution system of the engines. The piping is arranged for either batch or continuous cleaning by means of two De Laval centrifugal lubricating oil purifiers. On the batch method the purified oil goes to the clean oil storage tanks. On the continuous method it goes direct to the engine and drains back to the sump tanks.

Two additional De Laval centrifugal oil purifiers are installed to take care of water and impurities in the diesel fuel oil, which also is served by Quimby pumps. Each of the four centrifugals has a capacity to handle 300 gph.

One of the unique features of this type of Busch Sulzer diesel engine is the piston inspection port. Each cylinder has annular space in the block below the exhaust ports. This space is painted with white enamel, has a plate glass covered opening on each side of the engine, and is fitted with an elec-

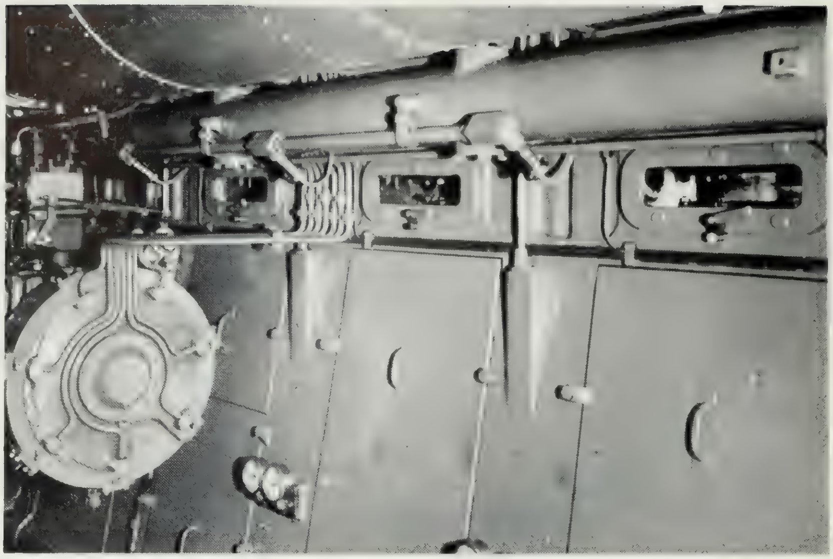


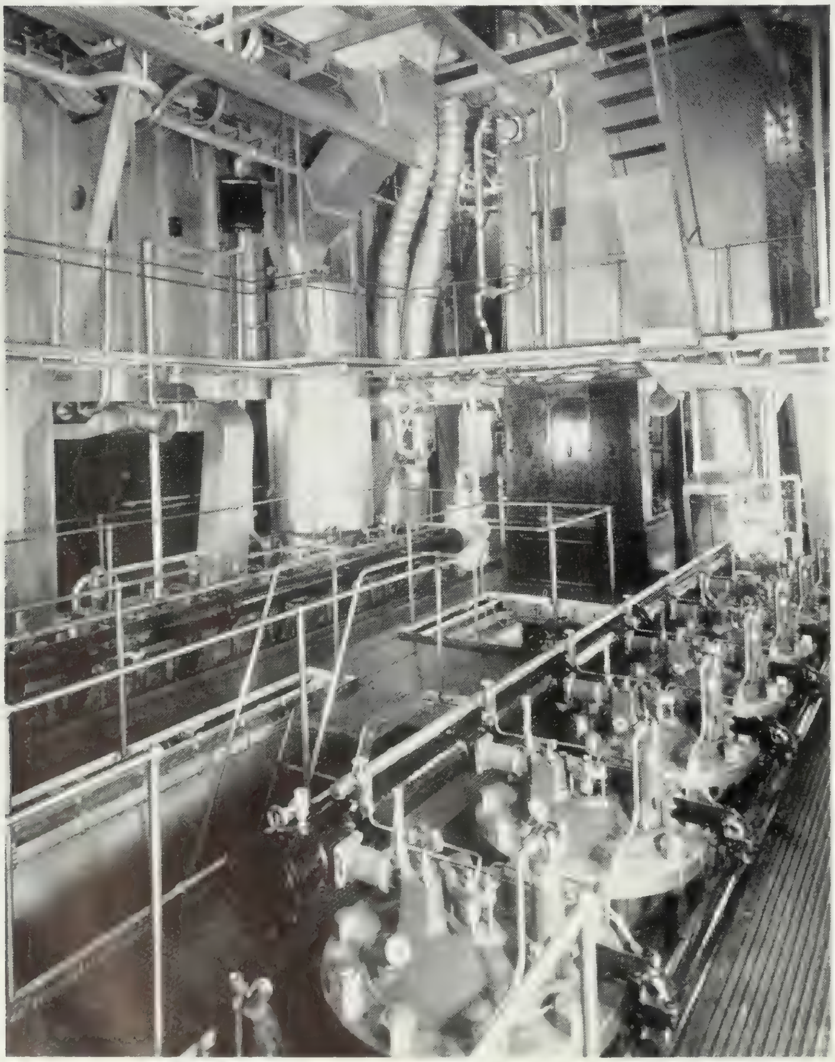
Control stand for the two diesel engines and their electric couplings tric light. By this means, the operating engineer can examine the piston skirt up to a point just below the lower ring and can discover immediately any oil leakage or scoring.

The electro-dynamic coupling which connects each of these engines to its pinion is by Westinghouse. It consists of two rotating members. The inner member is a spider mounted ring carrying on its outer face magnetic poles and windings of the squirrel cage induction motor type. This spider is bolted to the engine shaft flange.

The outer member is also a spider mounted ring carrying on its inner face the poles and windings of a salient pole rotating field, and bolted to the pinion shaft.

Direct current excitation at 230 volts is applied to the windings of the outer member through slip rings. These couplings have an air gap of about 3/8 inch between outer and inner poles. When operating at full normal power, their efficiency approximates 98 per cent, and the engine will be running at 240 rpm, the pinion at about 237 rpm, and the propeller at about 90 rpm.


Close-up of side of engine featuring piston inspection ports

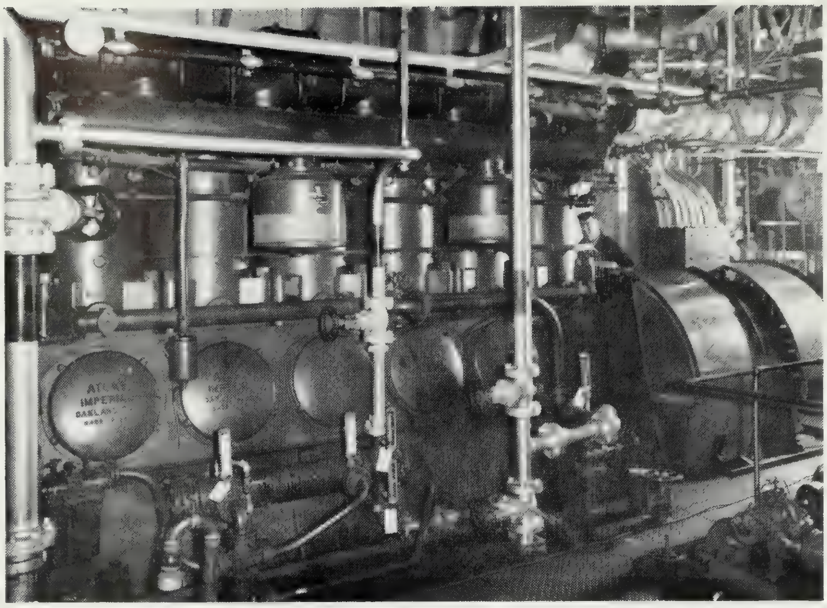

Engine room upper platform showing cylinder heads of main engines and in right upper background the waste heat boiler

The reduction gears are by the Farrel-Birmingham Company, Inc., and are of the double helical single-reduction type with thrust bearing of the Kingsbury type built into the casing. The gears and bearings are lubricated by a pressure system served by a Quimby pump that circulates the oil from the gear sump through strainers and coolers to the bearings and the gear sprays.

On the business end of the shafting is mounted a Doran four-blade solid bronze propeller, 17 feet 6 inches in diameter and weighing approximately 10 tons. The blades are of air foil section with a mean width ratio of 0.205, and have a varying pitch which is 17.84 feet at 7 feet radius.

This propulsion plant on trials came well under the guaranteed fuel consumption of 0.42 pounds of 19,000 Btu fuel oil per shp hour for all purposes when operating at 4000 bhp on main engines and 150 kw on the auxiliary diesel generating sets. The full fuel capacity of 1233 tons is sufficient to give these vessels a cruising radius of well over 20,000 nautical miles. On trials American Manufacturer easily maintained 16 knot speed at normal power and logged better than 18 knots on her overload tests.

Exhaust from the main engines is led into a Foster Wheeler waste heat steam generator which produces under normal conditions 2970 pounds of saturated steam per hour at 50 psi, from exhaust heat alone. This boiler has an oil-fired section for port use which can produce if needed 2920 pounds of additional steam. This steam is used for the whistle, for stand-by auxiliaries, fuel oil heating, cooking, operating an evaporator and distiller and heating of accommodations. The boiler serves as a silencer for the exhaust but a Burgess "Snubber" and spark arrester is installed in series and to take the full load of silencing, if for any reason it is desirable to by-pass the boiler.



One of the two 250 kw diesel engine generating sets that furnish light and auxiliary power

Auxiliaries

All of the auxiliaries with the exception of a few stand-by pumps are electric drive. The electric energy to take care of this load is produced by two 250 kw General Electric 120/240 volt compound wound direct current generators, each driven by a six cylinder mechanical injection Atlas diesel engine rated 450 bhp at 350 rpm. These engines have a cylinder bore of 13 inches and a stroke of 16 inches and are required to burn the same heavy fuel used by the main propulsion engines. Under test, on a nonstop endurance run of eight days at 375 bhp and two days at 450 bhp, the fuel consumption worked out at 0.379 lbs. per bhp hour.

Electric light and power distribution is effected through a General Electric, dead front type, switchboard.

The general service pumps are all vertical shaft centrifugals by the Warren Steam Pump Co.

The salt water evaporator and distiller are by Griscom Russel and have a capacity for delivering 6000 gallons of fresh water every 24 hours.

A Zeolite regenerating water softener is installed with a capacity of 13 gpm.

An oil and bilge water separator of the vertical cylindrical type built by Condenser Service and Engineering Co. has a capacity for 30 tons every 24 hours.

Emergency Equipment

A general alarm audible system of Bendix Corp. make is installed to cover all spaces.

The emergency generating set is a 15 kw General Electric generator driven by a Buda diesel engine rated 25 hp at 1450 rpm. This set is located on the bridge deck in a room at the after end of the house. A General Electric emergency switch board is hooked up to the main switch board in such fashion that when any failure occurs on the part of the auxiliary generating sets, the emergency set is automatically started up and maintains energy on emergency light and power circuits.

On each side of the after end of the bridge deck, a 58-person capacity Welin lifeboat is hung in Welin Crescent type davits.

It will be seen from the foregoing that the Maritime Commission C-1-B type motorships, as built by Western Pipe and Steel Company, are very complete cargo carriers and that no effort has been spared to make them comfortable, safe and economical.

Almost down to 1900 the old square riggers ruled the Pacific trades

C-1 Motorship

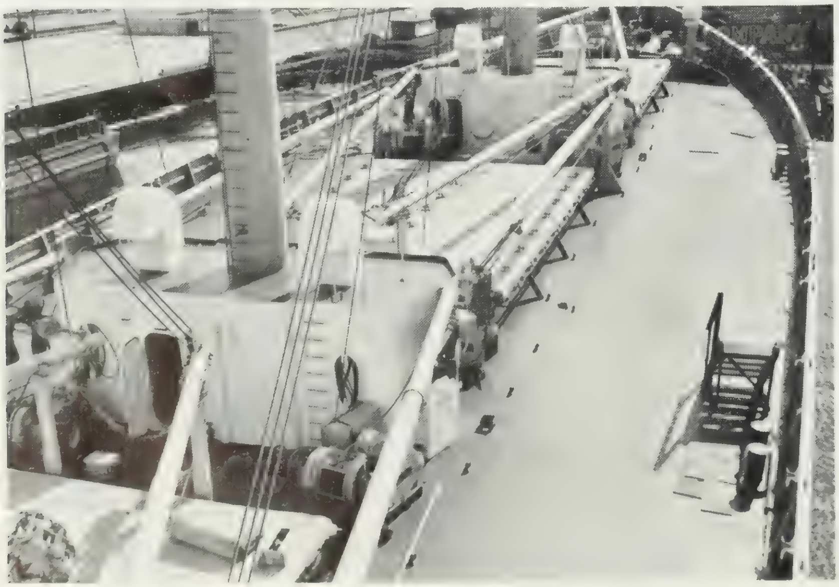
Tacoma Yard of Seattle Corporation Delivers

It was appropriate that they should call her Cape Alava after one of the capes on the North Pacific Coast, for she was built by a Tacoma shipyard, will be operated by a Seattle company, and her intended career, will be based on Puget Sound ports.

On April 3rd, she was formally delivered at the Tacoma plant of the Seattle-Tacoma Shipbuilding Corp., who built her, to the American Mail Line, who will operate her, and April 4th she was in Seattle ready to load cargo for her maiden voyage to the Orient. On April 9th, she sailed.

First of the C-1-B type of diesel freighter to be delivered by the Seattle-Tacoma Shipbuilding Corp., under the construction program of the United States Maritime Commission, this $2,217,000 vessel is also the first unit of a new fleet assigned to the American Mail Line of Seattle which is already operating six vessels in the Oriental service from Puget Sound and the Columbia River and, in some cases, making return stops at San Francisco. To these same operators from the same yards will shortly come a sister ship, the Cape Flattery. The Tacoma yard is also building three more vessels of this type, but they will go to different operators, as the American Mail has been assigned six of the Maritime Commission's C-2 types from Atlantic Coast yards, three of which will be delivered this summer and three more next year.

Hull construction of M. S. Cape Alava and her sisters is 90 per cent welded steel. Most of the parts, including tanks, framing, bulkheading, stacks, masts, and booms being placed in position by the big crane after being fabricated by welding as nearly complete as possible and then welded into place. Deck and hull plating has all been welded, the only rivets used being those connecting shell and frame, giving the hull a smooth, unbroken finish with little skin and eddy resistance.



Forward deck featuring cargo-handling gear

Hatches and Deck Machinery

The vessel is subdivided by seven bulkheads, all watertight to the main decks, and there are five cargo holds, three for'd of the machinery and two aft. These are served by five hatches, one for each hold, those on the main decks with steel covers, those below with wood.

Serving each of the hatches 2, 3, and 4 are four 5-ton booms and four electric winches, while the No. 1 and the No. 5 hatches, each have two 5-ton booms and two winches. One 50-ton boom is provided at the for'd end of hatch 2, and one 25 ton boom at hatch 5. All winches are electrically operated with local controls and were made by the American Hoist & Derrick Co.

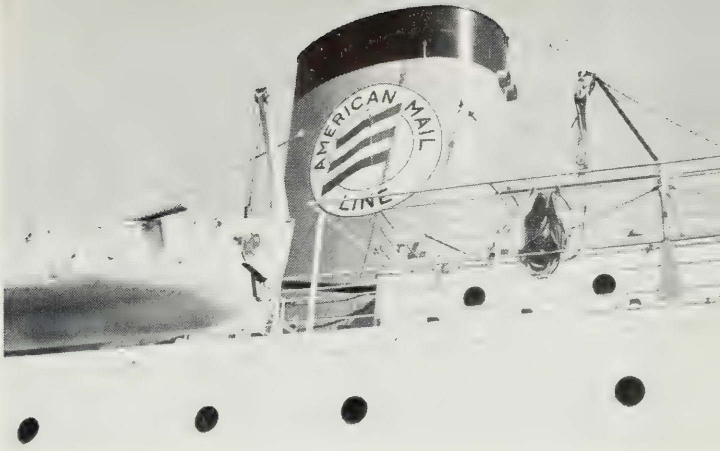
The foremast is located between hatches 1 and 2 and the mainmast between hatches 4 and 5.

An electric anchor windlass and a capstan (located aft) were both manufactured by the Markey Machinery Co. of Seattle. The windlass is of the Markey AW type, and is of note because it is the first of its type developed for big ship use, being of welded steel construction and entirely encased. It is designed to the breaking strain of a 2 1/16" chain and operated by a 50 hp watertight motor with local control mounted on the windlass.

The Markey capstan has welded steel housing and is driven by a 35 hp motor through worm and spur reduction gearing operating a shaft coming up through the deck. The capstan is

Cape Alava

Tacoma Shipbuilding Its First Ship



Above: Boat deck and funnel

mounted on a column, and the shaft extends on through this column to the upper section of the capstan head, lending strength to the entire assembly.

It is interesting to note that anchor handling speeds have been increased to an acceptable figure of 30 ft. a second and windlass controls arranged to differentiate between anchor handling and warping without sacrificing protection for the equipment. Winch and capstan heads are increased in size and whelps eliminated to increase the life of the rope. Warping capstan is equipped with overhauling drive with control similar to that of warping portion of the windlass, producing adequate warping power and high lightline speed and limiting maximum line pull to a safe value. Cargo winch and power speeds are greater in order to handle a high percentage of 3 and 5 ton loads with dispatch. Motor control equipment provides automatic acceleration both when hoisting and lowering. The davit and lifeboat handling equipment, manufactured by Welin, has been improved with respect to safety and the power of the electric winches increased to give more speed. All cargo winches are on platforms except those at for'd end of hatches 2 and 5.

The steering gear is of the McKiernan-Terry hydro-electric type and is provided with telemotor control from the wheel house. Steering gear pumps have been improved by the increased use of anti-friction bearings. Universal use of "storage motion" control has done much to eliminate control casualties on this type of steering gear.

Accommodations

Cape Alava is designed essentially as a cargo boat. Very comfortable and commodious provision is made for a regular crew of forty-one, with six spare berths. She will also carry eight passengers in extremely comfortable and roomy staterooms on her boat deck.

On the main deck, quarters have been provided for the crew, messmen, petty officers, engineers, ship's office, cadets, steward and sparerooms. On the second deck is the galley, crew and petty officers' mess, loungerooms, laundry, gyro room, ship's refrigerated stores space, dry stores space, CO_2 cylinder room and hospital. The boat deck contains the dining saloon, passengers' quarters, officers' quarters and emergency generator and control room. On the bridge deck are the wheelhouse, chart room, radio room, fan room, captain's office and stateroom and a spare stateroom.

The accommodations for officers and crew, located high up, are especially airy, well-lighted and ventilated, and, with thermostat-controlled heating, are comfortable at all times. All are well furnished, with desks, reading lamps, porcelain plumbing and comfortable bunks and mattresses.

Ventilation and heating are provided by Sturtevant fans and an adequate duct system for all living and working spaces in the vessel. Ventilating air temperature is automatically controlled. Running hot and cold fresh water is installed for all lavatories, showers, sinks and laundry equipment.

Every provision has been made for protection against fire. All bulkheads, ceilings, panels in houses and quarters are of incombustible materials such as Johns-Manville Marinite paneling and steel doors. There is a complete smoke and fire detecting system as well as an automatic Lux fire-extinguishing system provided by Walter Kidde & Co. The ship is also fitted with a complete system of alarms in all quarters.

Below: Officers' and passengers' lounge and saloon; galley, and captain's office

Navigating Equipment

The pilot house is unusually large and is equipped with all the modern navigation devices such as the Sperry Gyro compass and automatic pilot, helm angle indicator, course recorder and radio direction finder. Here, too, is the Lux-Rich smoke detection system, an automatic telephone system, the engine room telegraphs and speaking tubes, and revolution counters. A complete Fathometer system for detecting depth is also installed. A completely equipped radio room furnished by the Radiomarine Corporation will keep the ship in touch with both ends of her long voyage at all times.

Propulsion Machinery

The propulsion engines are two Hamilton 6 cyl. two cycle, reversible diesel engines, 2½" bore and 27½" stroke, developing 2160 shp at normal revolutions of 233 and built by the General Machinery Corp., Hamilton Engine Division. At normal speed they drive the single propeller at 90 rpm through the Westinghouse magnetic couplings and reduction gear. These main power plants are unusually compact and include all of the latest operating and accessory equipment. American-Bosch system is used. Purolator fuel oil strainers, Ross heat exchanger units and Manzel lubricators with an Alnor pyrometer on the control board. Closed system fresh water cooling is used for the cylinders and cylinder heads. Oil cooling is used for the pistons. Gross weight of the engines is 440,000 lbs. for the two. Full controls for both engines and for the magnetic couplings are brought to a single stand in the engine room. The main engines are designed to operate on cheap bunker fuel oil, preheated in the double bottom tanks by steam, then going to the engines through: a settling tank; a Ross heater; a Sharples purifier; a day tank and another heater. On reaching the engine nozzles the fuel has been preheated to about 160 degrees.

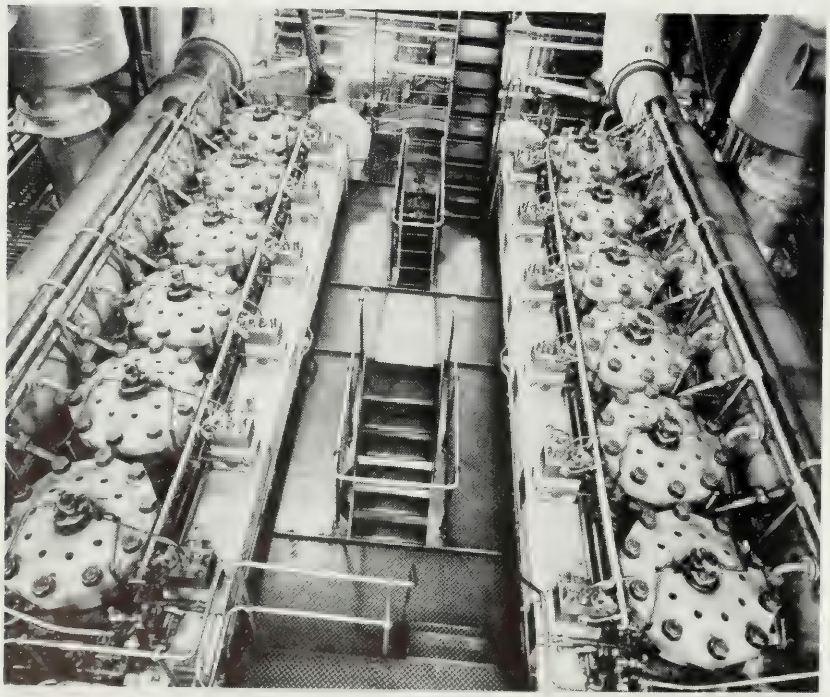
Reduction Gears and Couplings

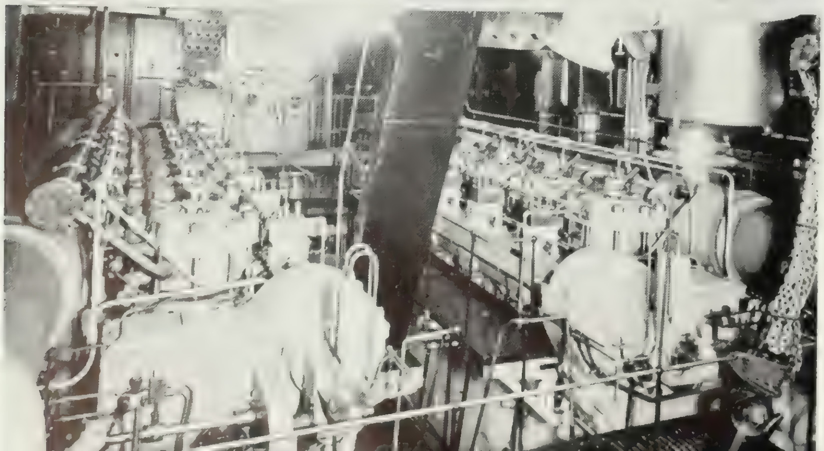
Although the main engines are of a heavy-duty slow-turning type, so far as diesel engine practice goes, their normal rpm is much too fast to accomplish economical propulsion for a heavy type freighter, if direct-connected. This problem is solved by the use of magnetic couplings and reduction gears.

The Westinghouse Marine Reduction Gear is of a twin pinion type unit of quill pinion design, having ratio of 2.55:1, reducing the full load speed of the two engines, 240 rpm to 90 rpm on the shaft of the single propeller. The Westinghouse magnetic couplings, however, that intervene between the engines and the gears, accomplish purposes which go much beyond this objective, performing three functions.

First of all, they act as flexible couplings between engines and gears, cushioning the gears against torsional vibrations from the engines. Second, they act as quick disconnecting clutches, enabling either engine to be cut out of service in a few seconds. Also, one engine may be kept running in reverse, the other ahead, and by a quick lever operation the vessel can be changed from full ahead to full astern very quickly. Third, they limit the torque to approximately twice the normal values. If something seizes one engine, the coupling will slip and permit the other engine to continue working without harm to the engine seized.

Each coupling consists of two elements: the inner or secondary element which is mounted in the engine crankshaft; the outer element or "field" which is mounted on the pinion shaft. This makes the connection between the engine and gears wholly magnetic and gives a smoothness and flexibility of operation and control approximating a diesel-electric drive. Operation of





Two views on upper platform of engine room showing cylinder heads of big Hamilton diesel engines these couplings is controlled by levers at the engine control station. Special provision is made for operating the ship at slow speed, and the clutch may be let in either before or after the engines are cranked. It is interesting to note in connection with the couplings that on trial tests, the difference in speed or "slip" with engines running and propellers turning normally, was less than one per cent. Both reduction gears and couplings are cased, making the installation practically one assembly unit.

Auxiliary Generating Sets

All of the electric power on the boat for heating, cooking, operation of windlass, hoists, magnetic couplings, and miscellaneous pumps, is supplied by two Washington diesel generating sets, manufactured by the Washington Iron Works of Seattle, which are also being installed in the other four C-1-B vessels being built by the Seattle-Tacoma Shipbuilding Corp. The engines are of the 4-cycle heavy-duty type, operating at 450 rpm, and have a bore of 12¾″ and stroke of 16″. They are fitted with a closed fresh water cooling system with both fresh and salt water cooling pumps driven by and mounted on the engines. The generators are General Electric 275 kw., 240/120 volt, three wire and are built for 25 per cent overload for two hours.

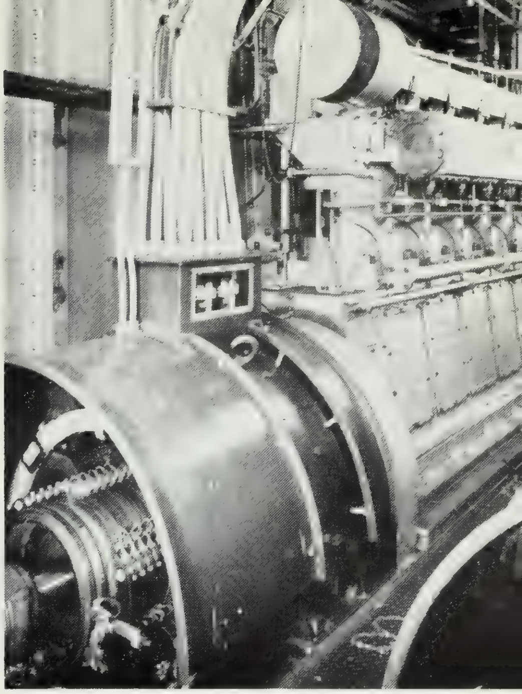
Accessories

A glance at the machinery control board shows that the vessel has as fine and complete control of machinery, fire protection, cargo handling, ventilating, heating, etc., as it is possible to have on a vessel of this type, with many innovations over any motorship previously constructed. In addition, practically all machinery in the engine room and aboard the boat is duplicated for emergencies, including pumps, radio, navigation equipment, steering gear, etc.

The drive shaft by the Erie Forge Co. is in five 23′11″ sections, with a 14¾″ diameter and swings a four bladed 17′6″ propeller manufactured by the Doran Co. of Seattle. Practically all the pump assembly is by Allis-Chalmers. Most of the motors are General Electric. Piston cooling oil is handled by Quimby gear pumps.

Starting air for the diesels is provided by two Worthington two stage, three cylinder compressors driven by 50 hp G.E. motors, with a small standby Ingersoll Rand 5 hp two stage compressor to make up losses from leakage or other causes when the vessel is on a long run at sea.

The radio room. Picture taken before installation was complete



Two Washington diesels supply light and auxiliary power

Ship and bunker oil heating is taken care of by a 3-section Foster Wheeler steam generator, operated either as a waste heat boiler from main engine exhausts or as an independently fired oil burning boiler.

Refrigeration for the ship's stores space, which is 2,000 cu. ft. lined with Armco metal, is supplied by a York ice machine.

A 15 kw. four cylinder Buda-powered emergency generator set in the upper deckhouse floats as a standby on emergency lighting and controls circuits.

Maxim silencers are used as spark arresters and noise subduers on the main and the auxiliary diesel exhausts.

On her trial trips, the Cape Alava made a remarkably good showing that was extremely gratifying to the Maritime Commission, the builders and the operators. She did considerably better than 18 knots, running light, under about the same trial conditions as the C-1s by Bethlehem and Federal. Her fuel consumption was 0.4 lb. per shaft hph and economy of lubricating oil was also indicated. In reversing and maneuvering, her engines worked with remarkable smoothness. There was an unusual absence of vibration when running at full speed, which is attributed to the fact that the propulsion machinery installation is well balanced and that the engine foundations were

(Page 72, please)

C-1-B cargo steamer Alcoa Pioneer on her trials in San Francisco Bay

S. S. Alcoa Pioneer

Bethlehem San Francisco Plant Delivers Second C-1-B Cargo Steamer

The fine cargo steamer shown herewith was built at the Potrero Works, Union Plant, Bethlehem Steel Company, Shipbuilding Division, and is the second of a program of five sister vessels. S. S. Cape San Martin, first of the five, was delivered early in February to the Grace Lines and is now in satisfactory operation.

The Alcoa Pioneer was recently delivered to the Alcoa Steamship Company, Inc., a subsidiary of the Aluminum Company of America. The other three ships will also go to Alcoa and are named Alcoa Pilgrim, Alcoa Patriot and Alcoa Puritan.

The general characteristics of these vessels are given in the table herewith. In design, cargo equipment, navigation equipment and fittings for the care and comfort of passengers and crew they are practically identical with the C-1-B motorships already described in this issue.

General Characteristics
C-1-B Cargo Steamers

Length overall		417′9″
Length B. P.		395′0″
Beam molded		60′0″
Depth molded main deck		37′6″
Draft loaded		27′6″
Deck height, 2nd to main		9′6″
Gross measurement (est.)		6863 tons
Net measurement (est.)		4007 tons
Normal propulsion power		4000 shp
Sustained sea speed		14 knots
WEIGHTS		
Built		3780 tons
Fuel oil	1301 tons	
Fresh water	415 tons	
Crew and stores	30 tons	
Cargo	7349 tons	
Deadweight capacity		9095 tons
Displacement loaded		12875 tons
Normal crew		43
Passenger capacity		8

On Alcoa Pioneer and her sisters, the following name plates appear prominently on machinery and equipment outside engine room: American Hoist and Derrick winches, driven by Westinghouse motors; Lidgerwood windlass, driven by Westinghouse motors; Lidgerwood steering gear, actuated by Northern pumps, driven by Electro Dynamic motors; Crane plumbing fixtures; American Blower Co. ventilating fans; Fulton Sylphon Co. temperature controls; Edison Electric galley range; Tanner sounding machine; Caterpillar diesel, General Electric generator, emergency set; and Westinghouse emergency switch board.

Propulsion Machinery

The propulsion power plant of Alcoa Pioneer is all installed in one machinery space and comprises two water tube boilers which supply steam at 450 psi throttle pressure and 740° F. temperature to a cross compound double reduction geared turbine with a normal rating of 4000 shp and a capacity to carry 4400 shp continuously and 5000 shp for two hours.

Babcock & Wilcox supplied the single pass type marine water tube boilers which are equipped with Todd variable capacity oil burners, and Sturtevant forced draft fans. Hagan Combustion control is installed and the feed water is conditioned by the Hall system. Fittings include: Reliance "Eye-Hye" water glasses; Ess "Haze Gage"; and Diamond soot blowers. These boilers deliver steam at the superheater outlet with 450 psi pressure and 750° F. temperature. Each unit has a continuous steaming capacity to deliver 18,500 pounds at those conditions.

The main propulsion unit is of the Bethlehem cross compound type with an impulse reaction high pressure turbine, and a reaction low pressure turbine having a two stage impulse astern element mounted at the exhaust end of the casing. Casings of both turbines are of rigid cast steel construction and have bleeder openings fitted with stop check valves to allow extraction of steam for feed heating and for evaporator and for ship's heating systems. The high pressure turbine rotor at rated power turns 5500 rpm and the low pressure at 2700 rpm. Each is connected to its pinion through flexible coupling, the low pressure connection having two such couplings with a quill shaft passing through the pinion shaft to the after side of the pinion.

Falk supplied the double reduction gear for these ships. It is of the double helical type with a Kingsbury type thrust bearing incorporated in the casing.

The propeller is a four-bladed solid bronze wheel by Doran.

The turbine casings are bolted rigidly to the gear case at the after end but are mounted for axial flexibility at the forward end. The weight of the condenser is taken by two beams which form the sides of the exhaust casing. The after ends of these beams are bolted to the gear casing and the forward ends rest on the structural member forming the foundation for the forward ends of the turbines.

Lubrication for the turbine bearings and for the gears is serviced by Quimby pumps and the oil is kept clean by Gould "Hyroil" purifiers.

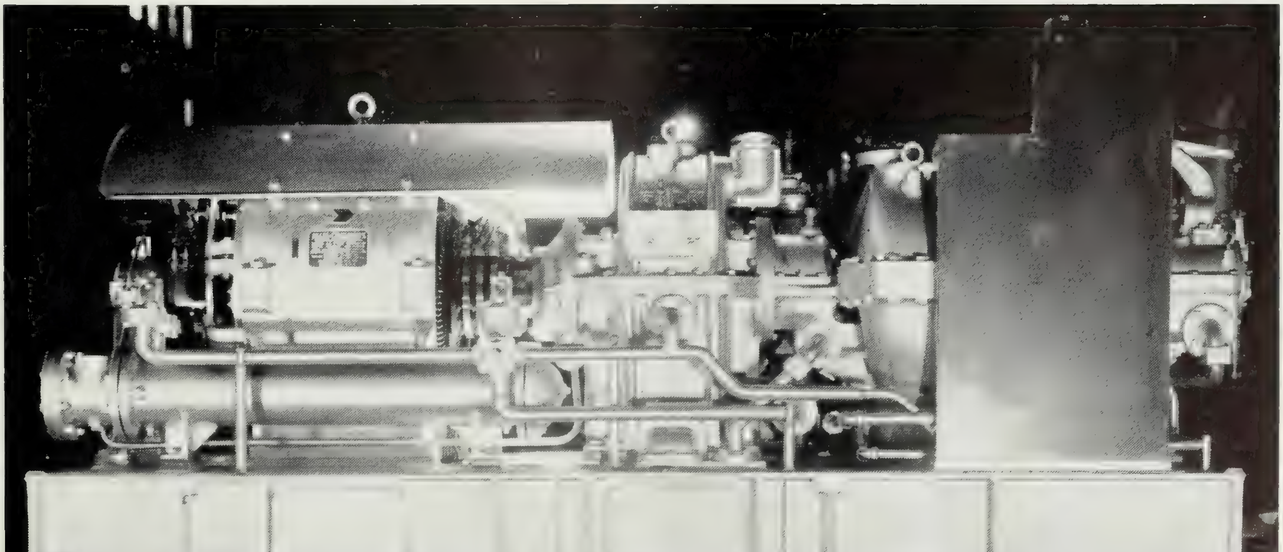
All general service pumps in the engine room are by Ingersoll Rand with Electro Dynamic motors.

The feed pumps are of the Worthington plunger type driven through spur gears by Electro Dynamic motors. These pumps take their suction from the hot well formed by the large capacity tank of the Cochrane deaerating feed water heater, and deliver the feed water to the boilers through a high temperature heater.

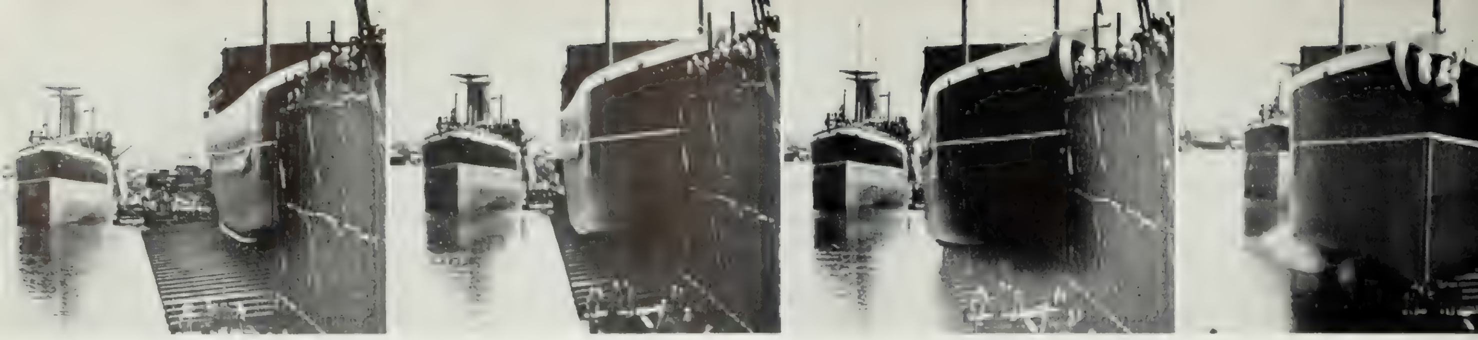
All of the engine room and deck auxiliaries and all of the cooking and lighting are fitted for electrical operation, and power for this load is generated by two Allis Chalmers turbines taking steam at same conditions as the main turbines, and each driving an Allis Chalmers three wire 120/240 volt 250 kw direct current generator. The turbines turn 8000 rpm at normal rating and drive through Falk reduction gearing to turn the generators at 1200 rpm. This electric power is distributed through a Westinghouse dead front switch board.

Although the official results of the test of this power plant have not been made public by the Maritime Commission, unofficial observers, who have attended also the trials of several Atlantic Coast built C-1-B cargo steamers, report to us that the first Bethlehem San Francisco job, the Cape San Martin, made a better fuel economy record than any of the other C-1 steamers tested up to that time, with a figure of 0.604 pounds per shaft horsepower hour on 18,340 Btu fuel as compared with a guarantee of 0.63 pounds per shaft horsepower hour, 18,500 Btu fuel.

This is a record of which the Potrero Works organization may well be proud.



One of the 250-kw geared turbo generating sets on Alcoa Pioneer



Eight progressive views chosen from a group taken by a camera fixed in

Fabricated in a Steel Launched in an

Consolidated Steel Corporation of Los Angeles, fabricating the hulls of C-1-B cargo steamers in its Maywood shops and erecting those hulls in a shipyard twenty miles away at Long Beach, has the rather unique distinction of launching them into a channel closely surrounded on both sides by oil well derricks.

This firm has two in the water, the Cape Mendocino and the Agwiprince, and one and a half on the ways. The first two ships are allotted to the New York and Cuba Mail Steamship Co.

The general characteristics of these vessels are the same as those shown for other C-1-B steamers described in this issue. Cape Mendocino is approximately ready for her trial runs and will soon be taking her place as part of the American Merchant Marine.

Each of the ships will be propelled by a single screw driven by a cross compound double reduction gear turbine taking steam at 450 psi pressure 740° F. temperature at throttle from two oil-burning water tube boilers and exhausting into 28½ inches vacuum. Under these conditions the normal rating is 4000 shp with a capacity for continuous ten per cent overload and two hours, 25 per cent overload.

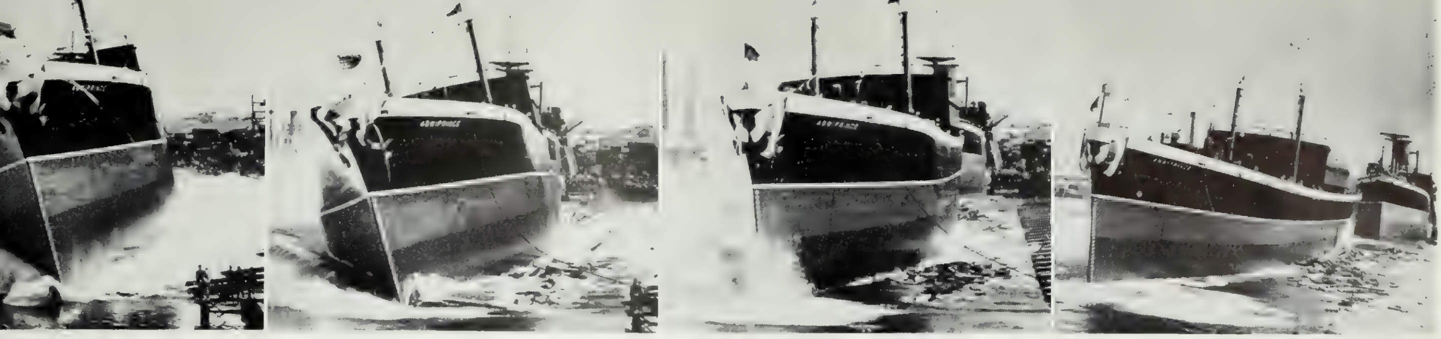
The boilers are Babcock & Wilcox single pass marine type with B. & W. superheaters and air preheaters. Each boiler has a maximum continuous steaming capacity of 18,500 lbs per hour of steam at 450 psi pressure and 750° F. total temperature.

Westinghouse supplied the main propulsion turbines and all of their principal appendages, including: the double reduction gear set; the main condenser; and the air ejector.

Westinghouse furnished also the two 250 kw turbo generating sets for auxiliary electric light and power, together with: the auxiliary condenser and its air ejectors; the main light and power distribution switch board; the emergency generator; the emergency switch board; the winch motors and their controls; the steering gear motors and their controls; the ventilation fan motors and their controls; the searchlight; and the bracket fans for rooms.

The feed water and steam system are practically the same as those described for other C-1 steamers in this issue. A Worthington pump deaerating heater is installed in the feed water system and Worthington pumps, driven by General Electric motors, take care

An end view of Agwiprince taking the water in the midst of a forest of oil well derricks



one position and fitted to take several shots a second as Agwiprince went over

Mill Oil Field

of the general engine room and ship services.

For smoke detection and fire extinguishing, a carbon dioxide system was furnished by the C-O-Two Equipment Company. This system covers cargo holds, engine room, lamp and paint room and emergency generator room.

American Hoist and Derrick Co. supplied the windlass, the capstan and the 16 cargo winches.

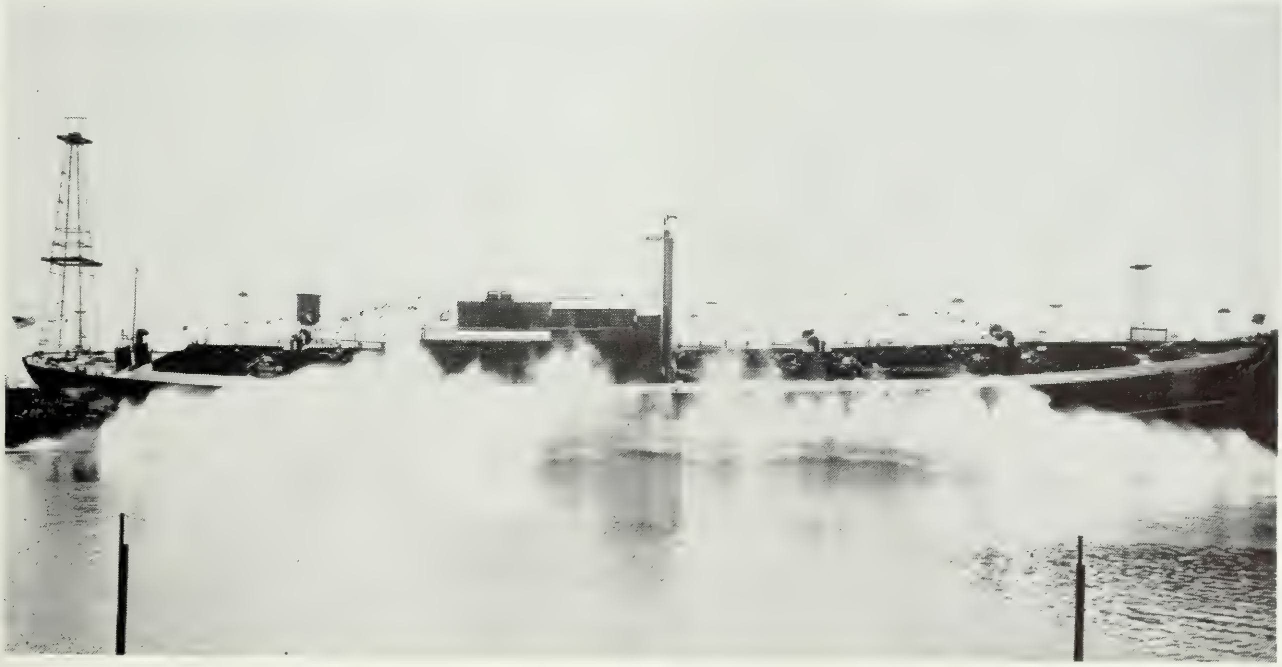
The steering gear is by Lidgerwood.

On the completion of the Cape Mendocino and after her sea trials which are scheduled for the very near future, we will publish an illustrated and full description of this fine steamer.

The Long Beach sidewise launchings of the ships being built by Consolidated Steel Corporation are creating widespread interest in Southern California and attracting large attendance.

On April 27, when Agwiprince went over, she was sponsored by Mrs. Edward B. Simmons of Coronado, California, wife of Ensign Simmons, U.S.N., and niece of Robert Stone of New York, a director of Cuba Mail. Mrs. Simmons' matron of honor was Mrs. Ray Wilson of Seattle. Mrs. Simmons and Mrs. Wilson were accompanied on the launching platform by R. W. Gerhart, manager of Consolidated Steel's Pacific Coast Shipbuilding Division.

Prominent guests included the following: C. H. C. Pearsall, vice president of New York and Cuba Mail Steamship Company; A. G. Roach, executive vice president of Consolidated Steel Corporation, Ltd.; Arthur M. Tode, honorary national president of the Propeller Club of the United States; Ralph J. Chandler of the Matson Navigation Company, and president of the Propeller Club of the United States, Port of Los Angeles No. 66; H. J. Summers, principal surveyor of the American Bureau of Shipping; James G. Craig, president of Craig Shipbuilding Company, Long Beach, California; W. W. Powell, president of Los Angeles Shipbuilding and Drydock Corp.; John A. McCone, president of California Shipbuilding Corporation; Capt. R. B. Coffman, U.S.N., assistant commandant, 11th Naval District; Mayor Francis H. Gentry of Long Beach, California.



Launching of Agwiprince taken from across the channel showing peculiar jet-wave formations

Artist's conception of emergency type steamer

Richmond Shipbuilding Corporation

Richmond Now Has Two Shipyards—55 Ships

The City of Richmond, on the east shore of San Francisco Bay, has always been an industrial center and port. Here are situated: the main refinery of the Standard Oil Company of California; the Pacific Coast plant of the Pullman Car Company; a large Certain-teed Products Corp. plant; a large assembly plant for Ford cars; and many other industrial establishments.

Today Richmond is rapidly taking a lead as a shipbuilding center with thirteen ways for building ocean-going ships in operation or under construction for two huge shipbuilding plants on her inner harbor.

Here the location is ideal for shipyard purposes with flat firm ground overlying rock on the foreshore facing extensive tidal flats of soft, easily-dredged mud over good foundation.

The first plant to start was the Todd-California Shipbuilding Corporation, which broke ground for a seven-way yard early in January. In exactly 78 days, on April 14, this yard laid the first plates for the keel of Hull No. 1 in an order from the British Purchasing Commission for thirty standardized cargo steamers, at a total estimated cost of $50,000,000.

Todd-California Shipbuilding Corporation is an association of the Todd Shipyards Corporation with a powerful group of Pacific Coast contractors known as the Six Companies; the same type of association and between the same groups that formed the Seattle-Tacoma Shipbuilding Corporation at Seattle; the Todd-California group is headed by Henry J. Kaiser of Oakland as president.

On April 18, four days after laying the first keel in the Todd-California yard, Henry J. Kaiser closed a contract with the U. S. Maritime Commission to build a new yard at Richmond for the construction of twenty-four emergency type cargo steamers. This new yard is to be of six building ways and will be operated under an organization headed by H. J. Kaiser, and known as the Richmond Shipbuilding Corporation.

This plant will occupy a site adjacent to and east of the $5,000.000 plant of the Ford Motor Company.

It is estimated that the plant will cost approximately $5,000,000, and will employ some 6000 men when in full operation.

The lands have been acquired from the Atchison, Topeka and Santa Fe Railroad Company and the Parr-Richmond Terminal Corporation. Over 200 acres are involved in the site.

Dredging involving approximately 1,500,000 cubic yards and a surfacing of rock representing approximately 750,000 cubic yards will be required to place the site in good serviceable condition.

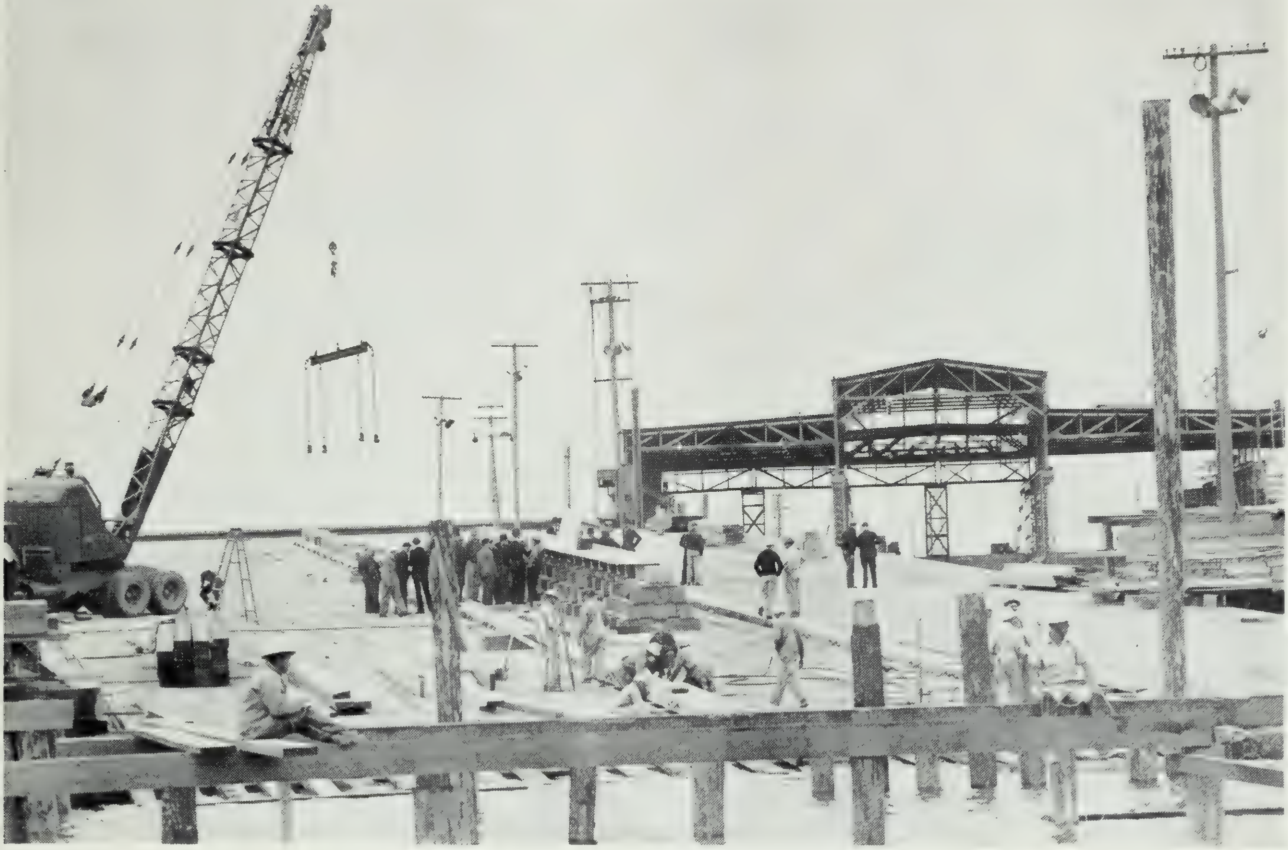
Construction of the plant will start immediately and it is expected that the first keel will be laid within four months.

It is expected that these two plants will bring from 12,000 to 14,000 additional employees to the City of Richmond.

The ships to be built at the Todd-California Corporation plant are of British design, and will be classed by Lloyds Register of Shipping. They are of 10 to 11 knot speed. Steam will be generated in Scotch coal-burning boilers and utilized in a reciprocating triple-expansion engine of 2500 ihp. The ships have a length of 416 feet, a beam of 57 feet, and a carrying capacity of approximately 10,000 tons total deadweight.

The ships to be built in the new yard of the Richmond Shipbuilding Corporation are to be 10 to 11 knots speed, but will have oil-burning boilers and reciprocating engines of 2500 ihp. The hulls have a length of 425 feet and a carrying capacity of approximately 10,000 tons total deadweight.

It is estimated that these ships will all be delivered within two years of the laying of the first keel.

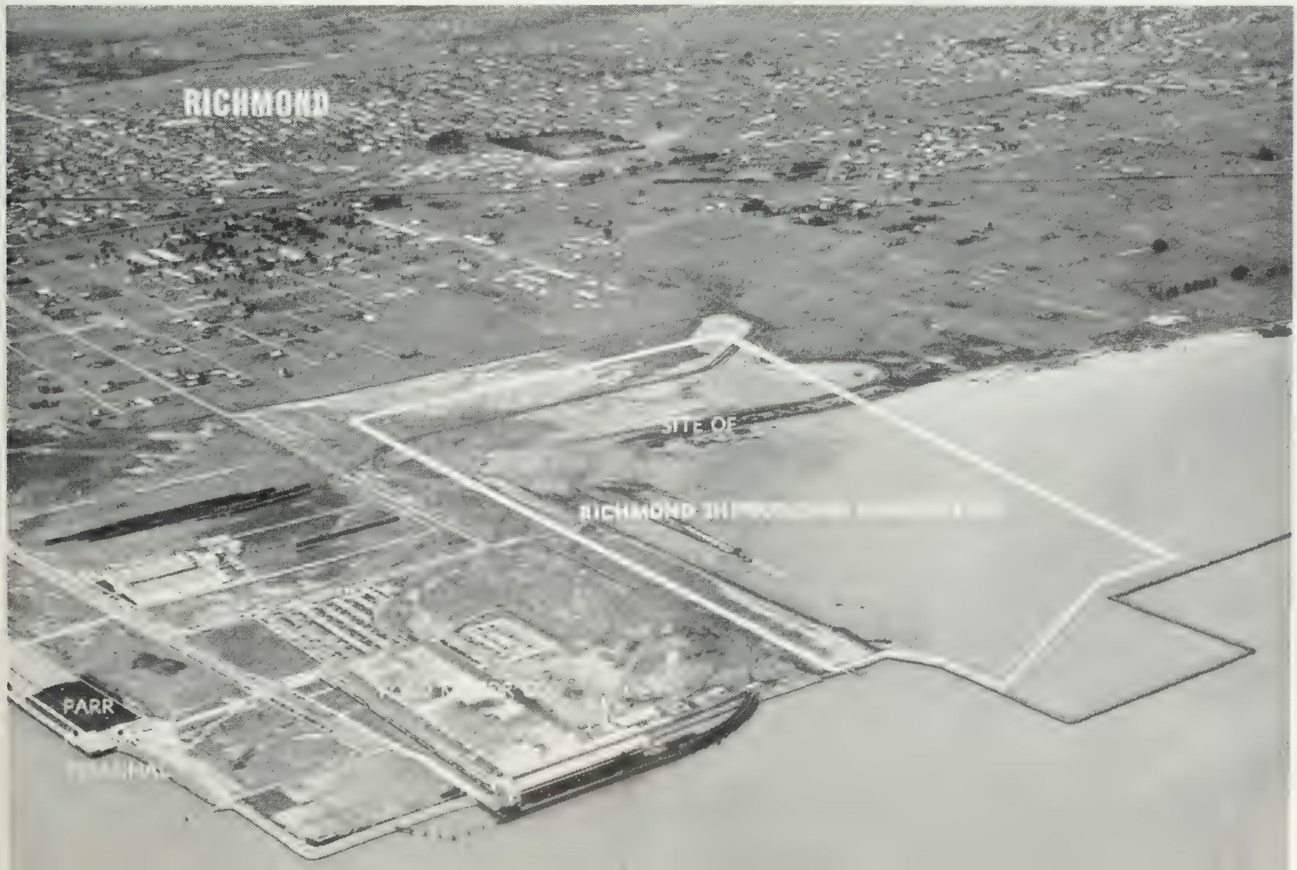


↑ *Laying keel plate for Hull No. 1 at Todd-California Shipbuilding Corporation Yard, April 14, Richmond, California*

Photo by courtesy of Oakland *Tribune*

↓ *Airplane view of the site of new yard for the Richmond Shipbuilding Corporation at Richmond, California*

Photo by courtesy Fred D. Parr



Hawaiian Merchant

Federal Stages For Matson

S. S. Hawaiian Shipper on her way to sea

Mrs. Frasier A. Bailey of San Francisco ready to christen

Two Matson Navigation Company liners building at the Kearny, New Jersey, yard of the Federal Shipbuilding and Dry Dock Co. were launched a few minutes apart on April twelfth.

The first ship was christened Hawaiian Shipper, and was sponsored by Mrs. F. A. Bailey, wife of the genial executive vice president of the Matson Navigation Company. The second hull was christened Hawaiian Merchant, and was sponsored by Mrs. Richard A. Cooke, wife of the 1940 head of the Hawaiian Sugar Planters' Association.

These vessels have the standard C-3 Maritime Commission hull with certain changes in interior arrangements and structure to suit the specialized trade and route.

The principal characteristics are shown on the table herewith.

Each vessel will have capacities for: 1672 tons of fuel oil; 68 tons fresh water; 18 tons distilled water; and 314 tons boiler feed water.

Seven watertight bulkheads divide the hull into eight compartments. From bow to stern these are: the fore peak; Hold No. 1, with hatch opening 20′ 0″ x 36′0″, and with 115,435 cu. ft. capacity; Hold No. 2, with hatchway 24′0″ x 30′0″, and with 87,348 cu. ft. capacity; Hold No. 3, with hatchway 24′0″ x 37′6″, and 189,845 cu. ft.; the engine room or machinery space; Hold No. 4, with hatchway 24′0″ x 30′0″, and 152,807 cu. ft.; Hold No. 5, with hatchway 24′0″ x 40′0″, and 112,110 cu. ft.; and the after peak.

No provision is made in this design for refrigerated cargo. In Holds No. 2 and No. 5, oil-tight deep tanks are installed for liquid cargo in bulk. The two tanks under No. 2 hold have a combined capacity for 1621 tons, and the tank under No. 5 hold will take 250 tons.

Principal Characteristics

Length overall	492′0″
Length between perpendiculars	465′0″
Beam molded	69′6″
Depth, molded, shelter deck	42′6″
Depth molded, freeboard deck	33′6″
Draft, loaded	28′7$\frac{7}{16}$″
Gross measurement (approx.)	7,730 tons
Net measurement (approx.)	4,540 tons
Light weight of vessel (approx.)	5,030 tons
Total dwt. capacity (approx.)	12,585 tons
Cargo deadweight at 28′7$\frac{7}{16}$″ draft	9,860 tons
Propulsion power, normal	8,500 shp
Propulsion power, maximum	9,350 shp
Specified sea speed	16½ knots
Cruising radius at 16½ knots	12,000 miles
Normal crew	43

Perishable ship's stores are kept in refrigeration chambers on the shelter deck amidships, where they are readily accessible to the galley. There are two of these chambers: a chill room, 803 cu. ft., 35° F.; and a meat and vegetable room, 586 cu. ft., 20° F. All of these conditions are maintained by a direct expansion system furnished by the York Ice Machinery Corporation, using Freon 12 refrigerant and served by duplicate 2⅝″ x 2½″ York 4″ x 4″ compressors, each driven by a 5-hp Westinghouse motor.

Machinery Installation

Steam for all purposes on the ship is provided by two "D" type Foster Wheeler marine water tube steam generators, each of which has a normal capacity of 37,500 pounds of steam per hour at 465 psi pressure and 765° F. temperature. Under maximum load, each unit has a steaming capacity of 56,250 pph.

This steam generating equipment supplies steam to the propulsion tur-

Hawaiian Shipper

Dual Launching Cargo Liners

S. S. Hawaiian Merchant halfway down

bine at throttle pressure of 440 psi and throttle total temperature of 740° F. The turbine is a De Laval Steam Turbine Company unit with a normal rating of 8500 shaft horsepower delivered to the propeller shaft at 85 rpm. The turbine unit comprises: one high-pressure turbine of 11 stages; one low-pressure turbine of 7 stages; and one double-reduction gear connected to the turbines through flexible mechanical couplings. When the propeller shaft is turning 85 rpm, the high-pressure turbine rotor revolves 5012 rpm, and the low-pressure rotor 3459 rpm. An astern element of one 2-row Curtis and one Rateau stage is built into the low-pressure casing.

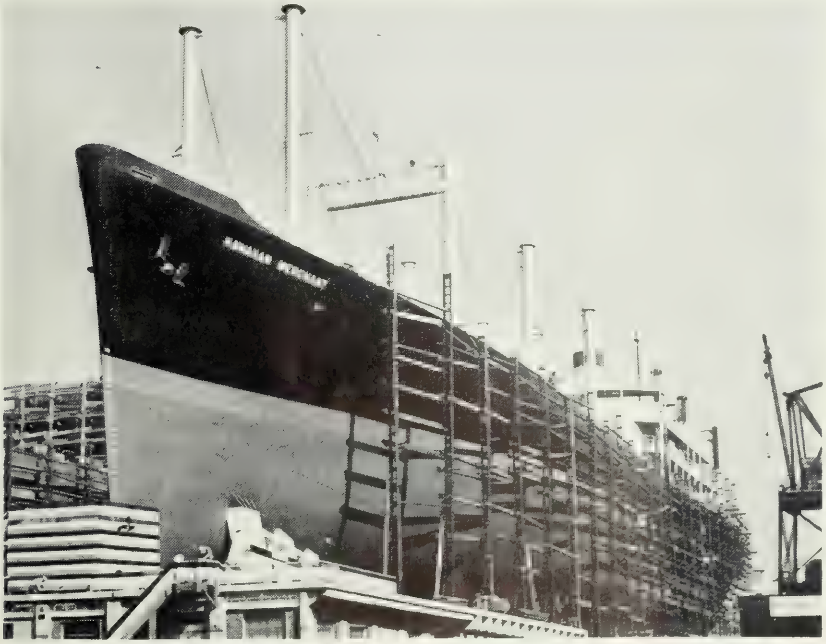
The propeller is a solid four-bladed bronze wheel, 21 feet 8 inches in diameter and having a pitch of 21 feet 8 inches. This wheel was cast by the Cramp Brass and Iron Foundry.

Auxiliary Power Plant

All service auxiliaries on deck and in engine room are electric drive. To carry this electric load, two 300 kw, direct current, 120-240 volt (DeLaval turbine-Crocker Wheeler generator) sets are installed on the dynamo flat. The turbines operate on the same steam conditions as the main propulsion units. The main switchboard is of the dead-front type furnished by the I. T. E. Circuit Breaker Co.

For emergency circuit light and power a 12 kw, 120 volt, direct current (Hill diesel engine-Electro Dynamic generator) set is installed on the shelter deck level.

Mrs. Richard A. Cooke of Honolulu
poised for action



American

Some Comment on Current Developments

Shortage of Seamen

A present or prospective shortage of seamen to man our expanding merchant marine is reported at most of the principal ports of the United States.

This fact was disclosed by a survey made by the Bureau of Marine Inspection and Navigation, Department of Commerce, at the request of the Director of the Selective Service System.

The request for a survey followed conferences with vessel operators and government agencies concerning repeated reports that shortages of seamen existed at various ports. Blame for such shortages was placed largely on the operation of the Selective Service Act by those reporting them. Shipping Commissioners, Collectors and Deputy Collectors of Customs were contacted by the Bureau. These officials are in constant and direct touch with the situation developing in their respective ports.

Results of the survey have been placed before officials of the Selective Service System for their guidance in administering the law. Attractive shore jobs are given as a major cause of shortages as well as the drafting of seamen for military service.

Only two ports—**Mobile, Ala.,** and **Galveston, Texas**—reported no shortages in sight.

The situation at **Boston, Mass.,** was reported acute, with shortages in licensed officers, able bodied seamen, qualified members of the engineer department, radio operators and cooks, and with reserve personnel exhausted and several vessels delayed in sailing.

Providence, R. I., reported a very serious present shortage, including able bodied seamen and qualified members of the engineer department, with a tendency to grow worse.

New York reported no present shortage, but pointed out that no surplus of available seamen exists and that the situation will grow worse.

A serious shortage was reported at **Philadelphia,** particularly in able bodied seamen, radio operators and cooks and the sailing of a number of vessels delayed on this account. The situation is expected to grow worse.

Baltimore reported a present and serious shortage of able bodied seamen and qualified members of the engineer department.

A similar shortage is reported at **Norfolk, Va.,** with the addition of a shortage among licensed personnel available for service.

Savannah, Ga., reported no present shortage but indicated a 60 per cent drop in the number of seamen normally available for service and predicted the situation would grow worse.

New Orleans, La., reported no general shortage, but added that only one-fourth of the number of seamen normally available are now to be had, mentioning specifically able bodied seamen and radio operators. Baton Rouge reported a serious shortage.

Seattle, Wash., reported a shortage in licensed officers, able bodied seamen and qualified members of the engineer department, but indicated the situation was not yet serious. A loss of licensed engineers to nearby shipyards was noted. Seattle expects conditions there to become acute.

Portland, Ore., indicated a serious shortage of licensed personnel, with no engineers available and conditions growing worse.

Shipyard work also was given by **San Francisco, Calif.,** as the chief reason for the shortage reported there, which is not yet regarded as serious, although it tends to become worse.

Records of the Bureau of Marine Inspection and Navigation cover a much larger number of licensed and certificated seamen than are required to man our merchant marine. Officials of the Bureau point out, however, that the mere fact that a man's name is listed does not mean he is available for sea service, as the recent survey clearly shows.

Wartime Petroleum Transport

The importance of tankers in the transportation of fuel in a world at war is among the subjects which were discussed by Mr. Eugene Holman, a Director of the Standard Oil Company (N. J.), in a talk before the American Institute of Mining and Metallurgical Engineers in New York on February 20.

Following are extracts from that part of the address by Mr. Holman which deals with transport.

There can be no question as to the ability of the petroleum industry not only to supply the world's present requirements but even to meet a very considerable increase in demand if it should come.

The United States produced last year 1⅓ billion barrels of crude oil, or

Shipping Trends

more than 60 per cent of the world's total. It could have provided more, if needed, because we have a large shut-in crude-producing capacity. Our refining capacity of 4,500,000 b/d is more than 25 per cent above our average refinery runs for 1940.

Adequate crude supplies and manufacturing also exist outside of the United States. There are large crude reserves in South America, in Iran and Iraq, in Russia and Roumania, in Sumatra and adjacent islands.

Not only are tanker shipments the most important in total transportation accomplished, but they also are subject to most readjustment in war. Secondary or short-haul transportation of the tank-truck type is comparatively little affected. Being internal rather than international in character, even the longer land shipments by pipeline and rail or inland waterway movements by barge are also less subject to disruption than in the case of tankers.

World Tonnage

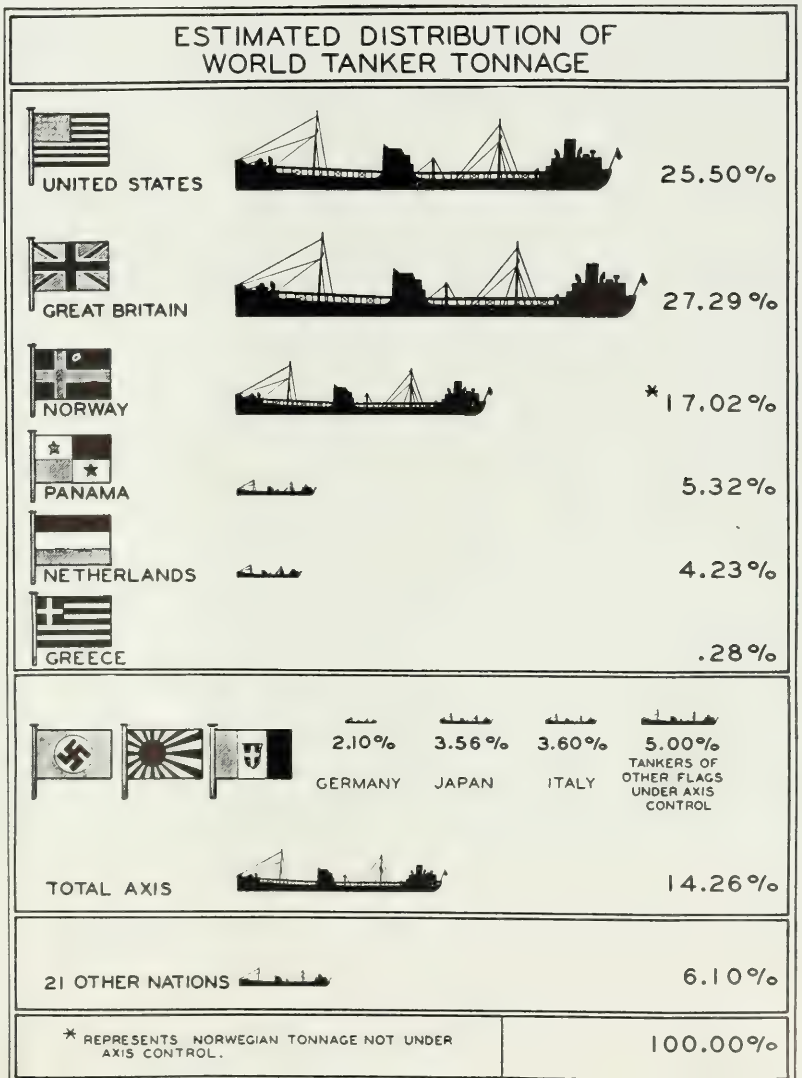
The world's tanker tonnage, allowing for sinkings reported, is now approximately 17,600,000 dwt. Tankers are rated in terms of "deadweight tons" (dwt) since this measure is indicative of the cargo-carrying capacity in long tons after correcting for bunkers and supplies. Deadweight tons can be approximately converted, on the average, to gross tons by dividing by about 1.5. Thus, with total gross tonnage of all merchant vessels in the world running between 65,000,000 and 70,000,000 gross tons, the tanker tonnage is approximately one-sixth of the total.

Sinkings

The British tanker tonnage combined with that of Norway, The Netherlands, Belgium and Greece is approximately 8,700,000 dwt, or nearly one-half of the world total. These figures are after allowing for reported sinkings of about 800,000 dwt, mostly British or British-controlled.

American Tanker Problem

The United States tanker market is distinguished by the fact that coastwise movements are reserved by law exclusively for American-flag vessels. In order to protect adequately these coastwise transportation requirements, it has been the practice for our tanker operations to carry a small surplus of United States-flag vessels. When these are not required for domestic movements, they are used in foreign service or tied up.



Gas-Freeing
# of Cargo Tanks with Steam Jets

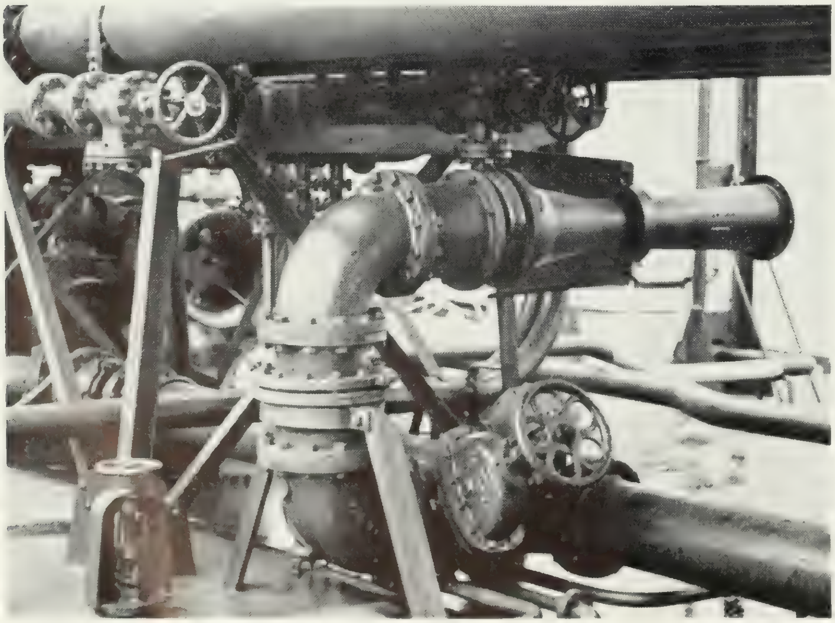
by Louis Bosa

Development Engineer, Shand & Jurs Co.

Idle ships are a liability; and when an oil tanker is tied in port for longer than necessary on account of the use of outmoded gas-freeing methods, the owner or operator pays in hard cash for the lack of modern and efficient equipment. Gas-freeing the tanker compartments is one of the necessary operations in the routine handling of an oil tanker. It can be accomplished only be renovating the air in the tanks a number of times sufficient to carry away all vapors. This air moving job should be done not only safely but also in the shortest time. The use of the old fashioned windsails can hardly be termed a time saving method, dependent as it is on weather conditions; furthermore, it implies the handling of a cumbersome apparatus. All of this is translated into an unnecessary increase of operating expenses.

The rapid acceptance of steam jet gas exhausters in the last few years is the tangible proof of their economic value. Some operators claim that these devices pay for themselves the first time that they are put in use. When we consider port charges and the time value of an idle tanker we may well believe that the worth of these devices is not over-estimated.

A steam jet gas exhauster constitutes a permanent installation on board ship: by manipulating a few valves it can be connected to the particular compartment to be gas-freed. With the ullage cover open, the exhauster creates a strong and turbulent air circulation throughout the compartment and the connecting piping, and throws overboard a mixture of steam and air laden with vapors. So fast and efficient is this method that an 8,000 barrel cargo tank is normally gas-freed in about twenty minutes.



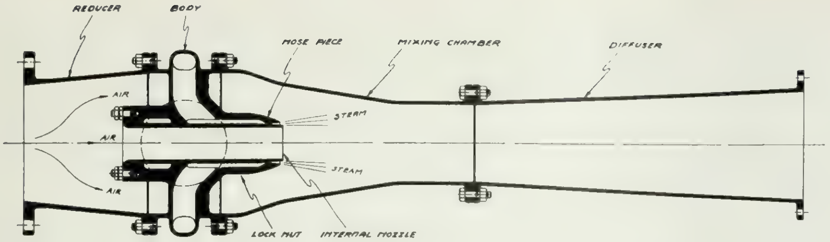
Steam jet exhauster on tanker deck, installed with swivel to turn port or starboard

Principle of Operation

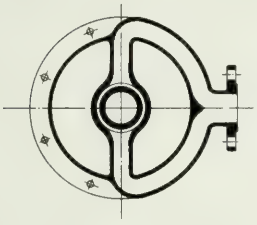
A steam jet exhauster utilizes the energy of a jet of high velocity steam to entrain air or vapors: it is constructed on the same old basic principle of the steam vacuum pump or of the boiler water injector. However, while the basic principle is the same, certain design proportions must be observed in a gas exhauster in order to obtain a maximum gas carrying power with a minimum steam consumption. A steam vacuum pump would be a poor gas exhauster because its capacity has been sacrificed to the power to create high vacuum; a boiler water injector, on the other hand, is proportioned for liquid entrainment instead of gas entrainment.

A typical device of the kind and expressly designed and constructed for tanker service is the Shand & Jurs Gas Exhauster. It makes use of an annular steam jet nozzle which allows greater contact surface between steam and entrained air in comparison with the usual solid round jet, for the same cross section area of the steam jet. Another interesting feature is the side steam connection which lends itself to good streamlining of the flow through the exhauster. Both features contribute to high air moving capacity for the particular service.

Steam jet exhausters have no moving parts; the compactness of the units and the safety of operation are the additional factors that favor the choice of steam exhausters in preference to turbine or electrically driven blowers, which from a purely mechanical point of view are unquestionably more efficient. They explain why hundreds of steam exhausters are successfully used



Longitudinal section of steam jet exhauster



SECTION AT STEAM INLET

on board European and American tankers.

The installation is indeed simple and requires very little space, a definite advantage on the crowded deck of an oil tanker. A favorite, flexible installation is the one shown in the accompanying illustration. A standard expansion joint is used as a swivel; two steam connections are set in the overhead steam line, and symmetrically located, so as to allow the exhauster to be swung either to port or starboard in the direction of the prevailing wind. The use of a steam strainer is recommended, because it will prevent foreign matter from lodging in and clogging the small nozzle clearance. A nozzle clogged with pipe scale or just plain dirt may cause insufficient delivery or may prevent the exhauster from operating at all.

For efficient operation, the steam delivered at the nozzle should be of good quality. Extremely wet steam results in greater steam consumption, decreased air delivery and accelerated nozzle wear. Insulated steam lines or a slight degree of superheat at the source insure good steam quality at the nozzle. Exhauster performance data are based on the use of dry saturated steam, and both steam consumption and the time factor increase slightly for a small degree of wetness, more rapidly for extremely wet steam.

The simplicity of construction of a steam exhauster reduces maintenance to an occasional inspection and cleaning of the nozzle. Once a year is usually sufficient.

Selection of Exhauster

The selection of a gas exhauster is obviously based on its all around economy of operation. At first sight it would appear that a criterion based on the volume of air moved per pound of steam should suffice. This would be true if steam economy were the paramount factor. It so happens, however, that when we seek a maximum efficiency (cu. ft. of air per pound of steam) the hourly capacity decreases, so that a longer time is required for gas-freeing a certain volume of cargo space. If this time is valuable, then a compromise must be accepted that will take into account both the efficiency and the time factors. The performance characteristics of a given gas exhauster can be varied between certain limits by suitable alterations in the nozzle setting. In the following table are shown, for example, performance figures relative to a 10″ S&J Gas Exhauster corresponding to the standard nozzle setting and to the high steam economy setting.

Nozzle Setting	*Capacity Cu. Ft./Air Per Hr.*	*Steam Consumption lbs./hr.*
Standard	325,000	4,810
High Economy	220,000	2,500

The total volumetric content of a 100,000 barrel tanker is 560,000 cu. ft.; assuming that the volume of air must be renovated four times for gas-freeing, a 10″ exhauster will have to move 2,240,000 cu. ft. of air. If 125 lbs. dry saturated steam is available at the nozzle, and if the nozzle setting is standard, the net time required for gas freeing will be 6.9 hours with a total steam consumption of 33,200 lbs. If the nozzle is set for high steam economy, the time required to complete the gas-freeing operation is instead 10.2 hours with a steam consumption of 28,700 lbs. The economy nozzle effects therefore an economy of 13.5 per cent in steam consumption but 48 per cent more time is required for completing the gas-freeing operation. Although gas-freeing time is an important factor, and usually the determining one, there are cases where steam economy, imposed by limitations in the water supply, is to be taken into account. The above brief analysis shows the flexibility of an exhauster installation between the limits inherent to the exhauster design.

Regarding size, a 10″ exhauster is generally sufficient for the average size tanker. If a large ship has to be serviced, or if cleaning time must be reduced to a minimum, a 12″ size would make available a capacity approximately 50 per cent larger. Of course, the steam supply must be able to satisfy the increased hourly steam consumption.

The use of steam exhausters has been found convenient for oil barges, and operators are appreciating the advantages of speeding up tank cleaning operations. A 4″ size is usually indicated for barge service, as well as for gas-freeing pump rooms in the larger ships.

Operation

A steam jet exhauster is merely a gas-freeing device and it is not a liquid pump. The tanker compartments must be, therefore, efficiently drained to prevent a liquid seal at the bell-mouths. With the exhauster connected to the deck line, the compartments are gas-freed one at a time by the proper handling of the line valves, and the opening of the respective ullage covers. The whole procedure of tank cleaning and gas-freeing varies according to the operator's preference and also according to the condition of the tank walls. Some operators prefer a preliminary thorough washing of the walls with a hot steam and water jet, followed by two or three changes of air with the gas exhauster. Others eliminate the first operation entirely and apply the gas exhauster immediately after draining. If the tank walls are properly coated against corrosion or fairly free from rust and scale, this method is highly successful, because the powerful suc-

(*Page 73, please*)

A single stateroom

S. S. Robin Locksley

A Modern Streamlined With Limited De Luxe

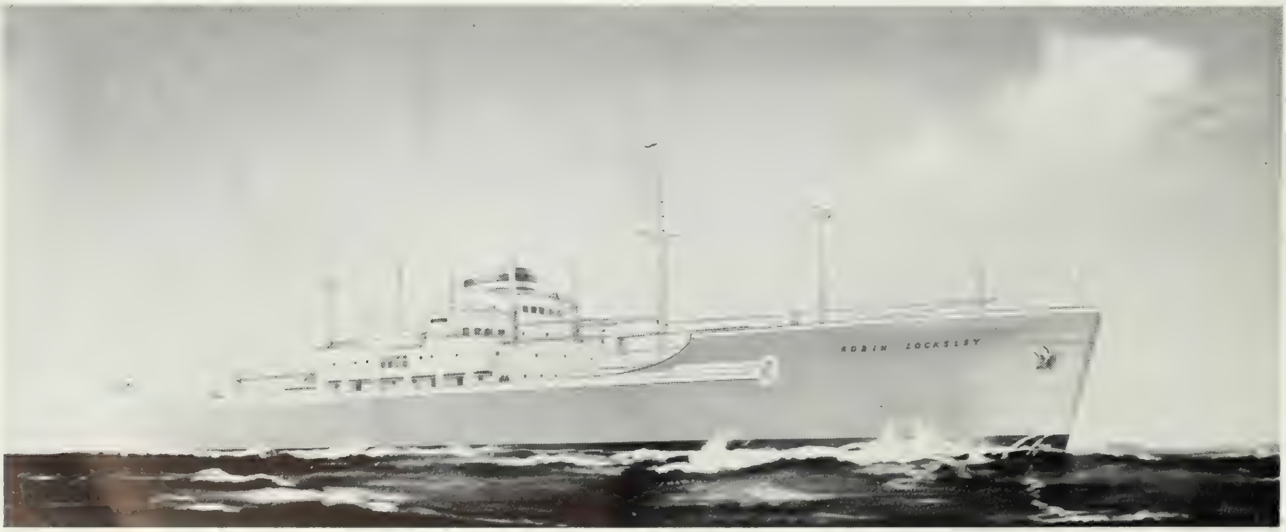
A minor sensation in New York shipping circles was occasioned by the arrival on March 11th of the smartly styled Robin Locksley, first of six new vessels for the Seas Shipping Company's Robin Line service to Africa. Designed by George G. Sharp, Naval Architect, she was built at the Sparrows Point Plant of the Shipbuilding Division of the Bethlehem Steel Company at a contract price of $2,250,000.

The design of the new Robin Line ships was prepared as a solution to the owner's problem as maintaining, with new ships, and on a sound economic basis, a schedule of monthly sailings in their freight service between the United States and Africa. This service covers a round trip distance of 20,300 nautical miles, and includes a total of eleven ports of call in Africa as well as a stop at Trinidad. on the homeward voyage, for fuel oil.

The Naval Architect's studies indicated that this problem would most satisfactorily be solved with three new ships, capable of a sustained sea speed of 16 knots, with the general characteristics summarized in the table herewith; and when the schedule was altered to provide fortnightly sailings, the number of ships required was increased to six.

A contract was subsequently negotiated between the Seas Shipping Company, the Maritime Commission, and the Bethlehem Steel Company for construction of the six vessels, at Bethlehem's Sparrows Point Plant, at a contract price of $2,250,000 for the first three vessels and $2,140,000 for the second three. The keel of the Robin Locksley was laid February 23, 1940, the ship launched October 5, 1940, and delivered March 6, 1941. The other five ships will be completed at approximately monthly intervals.

The new vessels are modern general cargo carriers with spacious and attractive accommodations for twelve passengers. They have been designed without camber or sheer and are characterized by a long raised forecastle, a large but compact midship superstructure topped by a well proportioned oval stack, and a shelter deck extending aft unbroken to a short poop which rises only to bulwark height and so does not break the line of sheer. These features, combined with a modern and original color treatment, give the ships a distinctive, racy appearance which is not ordinarily found in vessels of this class. The stack is painted a light gray, with a feathered red, white and blue insignia, the superstructure white,



The sleek, streamlined profile of Robin Locksley shows speed and class

Cargo Liner Passenger Accommodations

Lounge and dining room. Some class on a cargo liner!

the hull gray and the boot topping green; and an added dash of color is introduced in the unique winged shell insignia just forward of the break in the forecastle.

There are three hatches with one mast and a kingpost forward of the superstructure, and two hatches and one mast aft, with four kingposts mounted near the corners of the superstructure. Cargo is handled by means of sixteen 5-ton booms and sixteen American Hoist & Derrick Co. electric winches, hatches Nos. 2, 3 and 4 being double ganged. In addition, a 30-ton boom is provided at hatch No. 3 and a 10-ton boom at hatch No. 5. Through careful integration of the ship's structural features, the cargo spaces have been rendered remarkably clear of structural obstructions, and it is expected that loading and unloading will be accomplished in a minimum of time.

PRINCIPAL CHARACTERISTICS

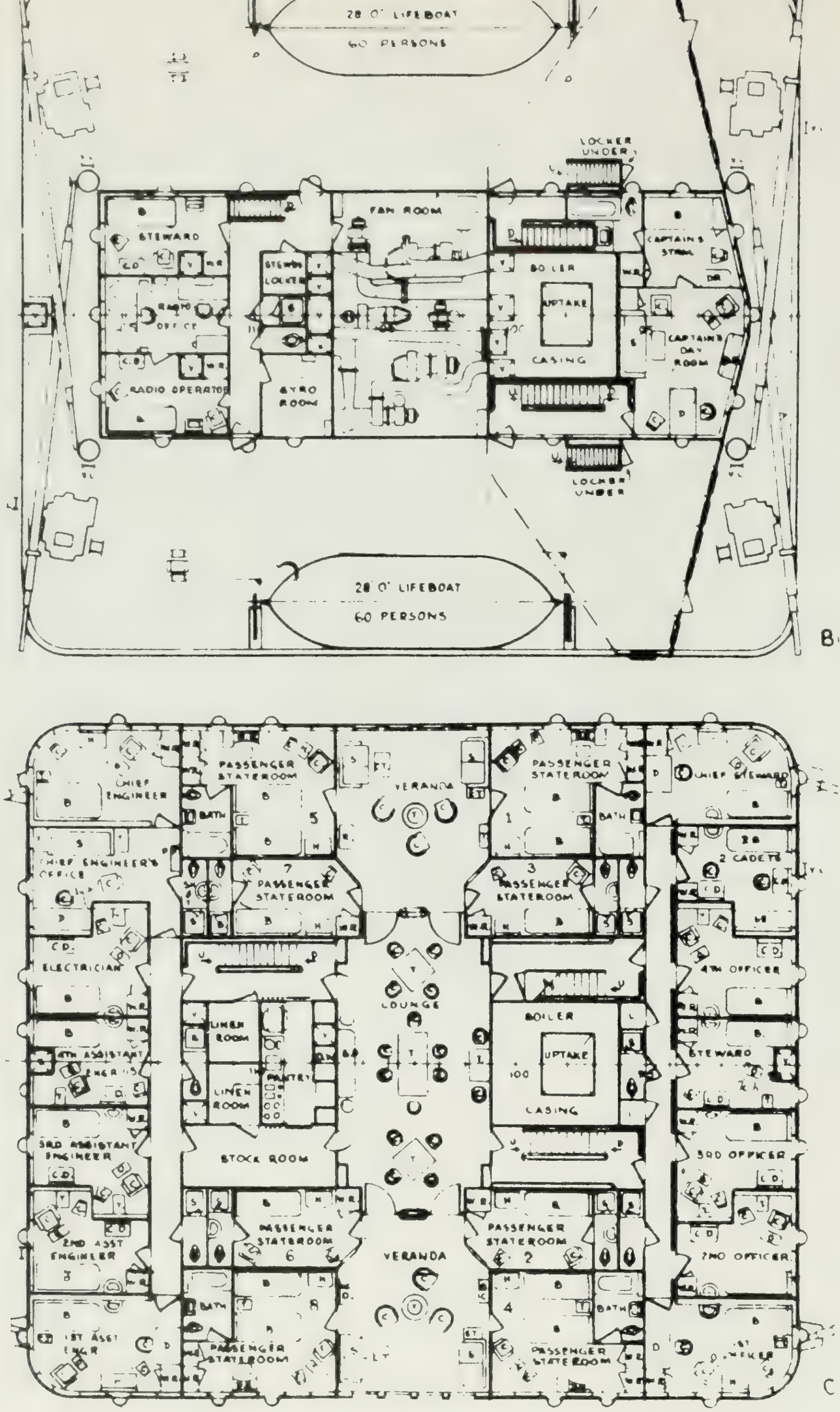
Length between perpendiculars	450 Feet 0 Inches
Beam, molded	66 Feet 0 Inches
Depth to shelter deck	43 Feet 0 Inches
Depth to 2nd deck	34 Feet 0 Inches
Depth to 3rd deck	24 Feet 0 Inches
Camber and sheer of decks	NONE
Designed load draft, molded, feet	27
Full load displacement, tons S. W.	15,084
Deadweight on load draft, tons	10,000
Gross tonnage	7101.04
Net tonnage	4258.80
Service speed, knots	16
Shaft horsepower, normal	6300
General Cargo, Cubic Feet (Bale) (Total)	608,670
Refrigerated Cargo, Cubic Feet	11,530
Ship's Cold Stores, Cubic Feet	4,640
Total Ship's Misc. Stores, Cubic Feet	18,185
Fuel Oil, Barrels (Double bottom and deep tanks)	13,622
Lubricating Oil, Gallons	5,705
Fresh Water, Tons (Double bottom and separate tanks)	613
Crew	47
Passengers	12

The vessels have the American Bureau of Shipping's highest classification in their type and service. Subdivision by seven transverse watertight bulkheads achieves a one compartment flooding standard. Investigation of transverse stability with one compartment flooded indicates that ample metacentric heights can be maintained in service.

The main propulsion unit is a cross-compound, double reduction geared turbine, producing a normal shaft horsepower of 6300 at 85 revolutions per minute.

The Trial Trip

The trials of the Robin Locksley were conducted under observation of



Arrangement plans of cabin and boat decks

the Maritime Commission Trial Board on February 24, 1941 in Chesapeake Bay. The ship was in light condition with all tanks full. One of the sister ships will subsequently undergo more exhaustive trials on the Rockland Course.

During the two hour maximum power test, four runs were made over the mile course off Kent Island. The average speed for these four runs was 18.17 knots.

The fuel consumption at normal power during the four-hour endurance run was .59 pshp hour for all purposes, based on preliminary calculations.

Decks

The new vessels have six decks above the inner bottom; the Bridge, Boat, Cabin, Shelter, Second and Third Decks. Two of these, the Shelter and Second Decks, are continuous from the stem to the aft peak bulkhead, where they break up to a higher level and are continued to the stern. The Third Deck extends from the forepeak bulkhead to the machinery space, where it is omitted, and is continued aft of the machinery space to the bulkhead at the aft end of No. 4 hold. Flats at two different levels, both port and starboard, are arranged in the machinery space to accommodate auxiliary machinery, engineers' workshop, turbo-generators, engineers' stores and refrigerating machinery.

All holds and all Third Deck 'tween deck spaces are arranged for carrying cargo, with a Cargocaire machinery room just forward of the machinery space on the Third Deck, and the steering gear, engineers' stores and lamp room on the steering flat just above Third Deck level.

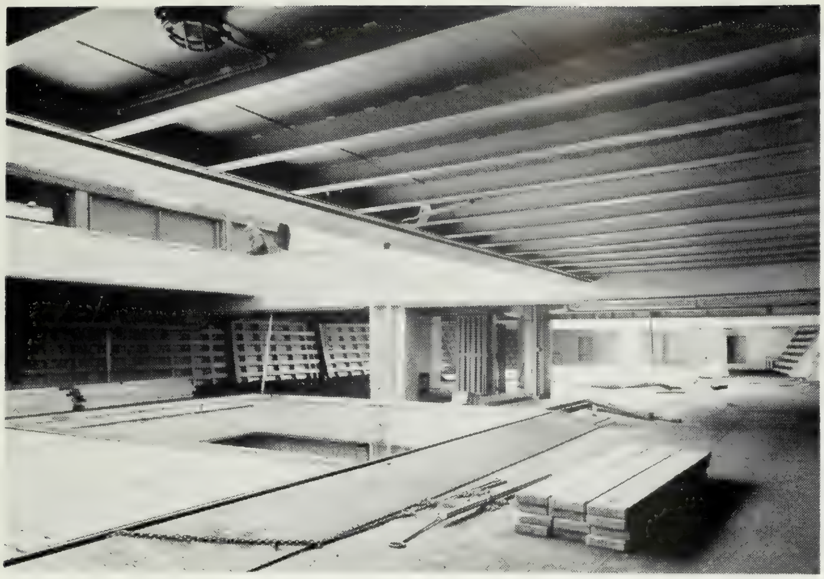
The Second Deck is almost entirely given over to carrying cargo, with the exceptions of ship's storerooms forward, between, and aft of the engine and boiler casings, and of spaces on the raised portion of this deck aft arranged as crew and passengers' baggage rooms, paint room, carpenter shop, boatswain's stores, engineers' stores, and capstan machinery room.

The forecastle on the Shelter Deck is largely given over to cargo, with a large boatswain's store forward, and bullion room, fan and resistor rooms at the forecastle and bulkhead. Amidships, four compartments, arranged for carrying refrigerated cargo, are located port and starboard. Two deckhouses containing special cargo lockers and fan and resistor rooms are located on the Shelter Deck between each pair of large hatches. The tops of these houses form raised cargo winch platforms. The accommodations for petty officers and crew, as well as the officers' and crew's mess rooms, galley, officers' and crew's pantries, hospital, laundry and ship's office are also located on the Shelter Deck, in the midship superstructure, which is recessed on this deck to permit fore and aft outside passages port and starboard.

The cabin and boat deck are arranged according to the plans reproduced herewith.

Passenger Accommodations

Among the particularly distinctive features of the ship are the unique passenger accommodations. In spacious-



'Tween decks, featuring welded connections and absence of camber and sheer

ness and completeness of appointment, they are the equal of any afloat. The arrangement is compact and symmetrical, giving complete privacy for the passengers, since none of the crew, with the exception of the stewards, have to enter these quarters during the normal operation of the ship.

The accommodations consist of two verandas, one port and one starboard, with four staterooms grouped around each, and a high central Lounge, furnished to serve also as a Dining Room. These rooms are arranged according to the well-known Sharp Veranda System.

The verandas are separated from the Lounge by Herculite glass screens and frameless Herculite glass doors, allowing an unbroken vista across the entire breadth of the ship. Four large Kearfott frameless windows are fitted on the shell side of each veranda, and these windows, together with glass brick panels above the boat deck in the upper portion of the Lounge, give a well lighted, stimulating and delightful suite of rooms, which provide a marked contrast to the low ceilings and general stuffiness usually found on vessels of this type. The Herculite screens and the glass brick installations are said to be the first marine use of these materials.

All the interior styling and decoration was handled by interior specialists in the organization of the Naval Architect. Mrs. Arthur Raymond Lewis, Jr., wife of the president of the Seas Shipping Company, selected colors and fabrics. Extensive use was made of the new plastics such as Lucite in decorative features. Goodyear rubber floor covering is used. W. & J. Sloane furnished all curtains and drapes and some of the chairs. The Simmons Company supplied beds, mattresses and much of the metal furniture. Plumbing fixtures are by Crane.

The four outboard rooms are double rooms, and the inboard veranda rooms are single. The double rooms have bathrooms fitted with a tub and overhead shower, the single rooms have showers only, enclosed in glass instead of the usual curtain. The bathroom and shower for each pair of rooms, together with an officer's shower and toilet, are arranged to form a block directly over a block of crew showers and toilets on the deck below, thus simplifying the plumbing installation.

The arrangement of officers' rooms is shown in the plan reproduced herewith.

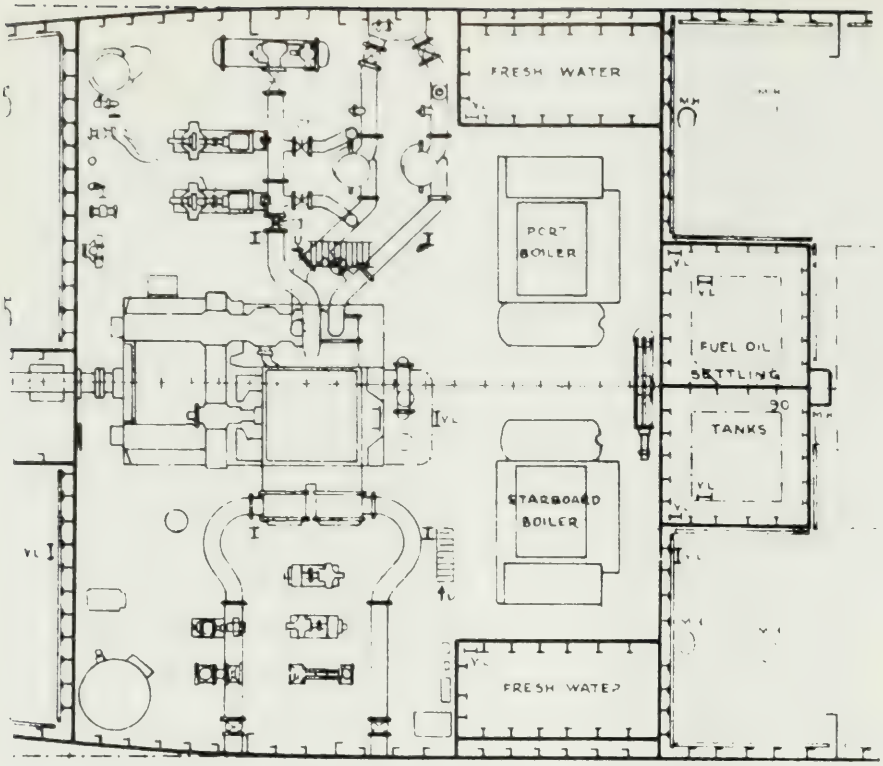
Propulsion Machinery

The Bethlehem main propulsion unit for the Seas Shipping Company ships consists of one set of cross-compound double reduction geared turbines. The normal rating is 6300 shaft horsepower at 85 revolutions per minute when operating with steam at 450 pounds per square inch gage pressure, 740 degrees F total temperature at 28.5 inches vacuum.

The unit includes a combined impulse-reaction high-pressure turbine in series with an all-reaction low pressure turbine, each turbine driving its own high speed pinion through flexible couplings. A two-stage impulse astern turbine is mounted in the exhaust end of the low pressure turbine casing.

The reduction gear, furnished by the General Electric Co., has two high

One of the verandas, off which open two staterooms forward and two aft



Arrangement of propulsion machinery lower platform

speed pinions and gears, the high speed gear driving its low speed pinion through a quill shaft and flexible coupling, and the two low speed pinions driving the main gear. A Howarth pivoted thrust bearing for the propeller shaft is built into the forward end of the main low speed gear casing. A motor driven turning gear, capable of being declutched, is fitted to turn the main unit and shafting slowly in either direction. The line and tail shafting is by Bethlehem. The Cramp Foundries supplied the four-bladed solid manganeze bronze propeller of 20 feet diameter and 21 feet pitch.

The forward end of each turbine rests on a support that is flexible in the fore and aft direction to allow for axial expansion of the turbine casing, but is rigid athwartship and vertical to preserve alignment. The aft end of each turbine is rigidly bolted to the gear casing. The condenser weight is taken by two fore and aft beams composing the sides of the low pressure exhaust casing. The forward ends of these beams rest on a strong athwartship structural member forming the forward turbine foundations. The after ends of the beams are bolted to the gear casing.

Lubricating Oil System

The lubrication system is of the forced type. Lubricating oil is drawn from the sump tank under the reduction gear and is pumped through duplex strainers and oil coolers to the bearings. A twin gravity tank is installed in the system at an appropriate height to maintain the proper pressure on the discharge system and to insure a supply of lubricating oil in case of pump failure.

A Quimby vertical gear-in-head screw pump driven by a 20 hp Westinghouse motor and having a capacity of 300 gpm at 45 psi serves the lube oil. A standby Warren steam-drive 8″ x 10″ x 24″ simplex double-acting pump is installed.

Lubricating oil is kept clean by a Sharples centrifuge oil purifier. Heaters and coolers and the oil separator for bilge and ballast water are of Bethlehem make.

The main condenser is of the single pass type with welded steel shell, tubed with 70-30 cupro-nickel ¾ inch tubes expanded at the inlet end and Crane packed with ferrules at the outlet end. It has 7005 sq. ft. cooling surface and will maintain 28½ inches vacuum under full normal power condition when supplied with cooling water at 75° F.

Two Warren vertical single stage centrifugal pumps serve the circulating water. Each is driven by a 40 hp Westinghouse motor and has a capacity of 7500 gpm at 465 rpm against 16 ft. head.

Vacuum is maintained by an Ingersoll Rand air ejector with inter and after condensers.

Boilers

Steam for these turbines is generated in two Babcock and Wilcox sectional header air cased water-tube boilers equipped with superheaters and air preheaters. Each boiler has three Babcock and Wilcox wide range type oil burners operating under Bailey automatic control. Normal output of the two boilers is 54,000 pounds of steam per hour on 450 psi and 750° F. at superheater outlet with feed water at 317° F. Under maximum conditions the total capacity would be 80,000 pounds per hour of steam same as above. Designed efficiency is 87 per cent. Each boiler has 4504 sq. ft. of water heating and 2721 sq. ft. of air heating surface.

Eighteen Vulcan soot blowers are installed. Each boiler is served by a Sturtevant motor driven induced draft fan with a maximum capacity of 14,100 cfm.

Feed System

The boiler feed system is of special interest. It is designed to keep the water entering the boilers as free from air as possible, and as installed is a closed system. Condensate is withdrawn from the bottom of the condensate pump and is discharged as circulating water through the air ejector to the Bethlehem first stage heater, then to the Worthington deaerating heater from which the feed pumps take their suction. The feed pumps discharge through the Bethlehem third stage heater to the boilers.

The various heaters all have a capacity to raise 54,000 pounds of feed water in the following temperature ranges: first stage from 90° to 171° F.; deaerating stage from 171° to 239° F.; and third stage from 239° to 314° F.

The two (one standby) Warren four stage centrifugal feed pumps are each driven by an Elliot steam turbine, and each has a capacity of 150 gpm against a pressure of 585 psi.

Practically all of the general purpose pumps are by Warren Steam Pump Co. and are motor drive.

Electrical energy for power, cooking and lighting is supplied by two 300 kw 240 volt direct current General Electric turbo-generator sets.

A 10 kw 120 volt dc compound wound Westinghouse generator driven by a Hill diesel engine automatically starts and takes over emergency circuits on any failure of the main generating plant.

Two 38.5 kw 240/120 volt Westinghouse motor generator sets furnish 120 volt direct current to the lighting circuits.

The main switch board of the dead front type, and local panels for lighting distribution were furnished by Westinghouse.

Hull Equipment

Steering gear is of the Lidgerwood single-ram electro hydraulic type, operated either by hydraulic telemotor from the pilot house, or by electric connections from the Sperry gyro-pilot, or by trick wheel in steering compartment. This gear will move the rudder from hard over (35°) to hard over in thirty seconds at full speed ahead.

The four Baldt stockless anchors (two 10,045 lb. bowers, one 8540 lb. spare and one 3605 lb. stream) together with two 150 fathom lengths of Naco stud links chain, are handled by the Lidgerwood spur geared windlass.

All air ports were furnished by Torrey Roller Bushing Works and are of brass or bronze, with the openings screened. Windows of four types in bronze frames were furnished by the Kearfott Engineering Company for the Pilot house, the verandas and the public rooms. Kearfott furnished also the window wipers for the pilot house.

Refrigeration

These ships have 11,530 cu. ft. of refrigerated cargo space arranged in four spaces of approximately equal size, two port and two starboard on the second deck. For ship's stores, there are three spaces—a vegetable room of 1810 cu. ft., a meat room of 2660 cu. ft. and a thaw room of 170 cu. ft.—all located amidships between the decks, 12 inched rock wool on bulkheads. Refrigeration is supplied by seven duplicate Carrier units.

Navigating Equipment

Very complete navigating equipment is installed. The wheelhouse contains, besides the steering stand, the control stand for the Sperry two-unit type Gyro-pilot system, a rudder angle indicator, a Mackay radio direction finder, a Henschel running light panel, engine order telegraph and revolution indicator. A Sperry course recorder and a Submarine Signal Company's Fathometer are located in the chart room. The bridge wings contain repeater stands for the gyro-compass system, and engine order telegraphs to port and starboard.

A complete gyro-compass system furnished by the Sperry Gyroscope Company, Inc., is installed. The gyro-compass is installed in the gyro-compass room on the boat deck with repeaters in the wheelhouse, on each bridge wing and in the radio direction finder cabinet. Magnetic compasses and binnacles for the ship were furnished by Kelvin White with binnacles in wheelhouse and at aft steering station. The standard compass is located on the wheelhouse top.

An eighteen inch incandescent pilot house searchlight was furnished by Sperry Gyroscope Company, Inc. The sound power telephone system has six stations, and was furnished by Henschel Corporation.

The Typhon whistle is No. 300 model furnished by the Leslie Company, who also furnished complete automatic whistle controls.

A complete ship's radio communication system, supplied by Mackay Radio & Telegraph Company, is installed.

Fire Detection and Extinction

A complete system of watchmen's key stations, defining the route of a regular patrol, is installed throughout the accommodations and storerooms midship and aft. For calling the crew and passengers, in case of an emergency, a manually controlled General Alarm System is installed, with gongs located at various points throughout the quarters and on the Second deck. The General Alarm Control and Master Controls for ventilating fans are located in the wheelhouse.

On each deck, within the stairway enclosures, there are fire stations containing hydrants, 75-foot lengths of hose, portable fire extinguishers and fire axes. The usual hose stations, with 50-foot lengths of hose, are located on the open decks. Three pumps are available for fire fighting purposes, giving a total capacity of 1050 gallons per minute.

A complete CO-2 extinguishing system protects the cargo holds and machinery spaces, as well as the paint room aft. This system was furnished by Walter Kidde & Co., Inc. A small

(Page 102, please)

Galley is an Edison equipped stainless kitchen

Torque Control
for Anchor Windlass Drives

by A. O. Loomis

Marine Engineering Dept., Westinghouse Electric & Mfg. Co.
East Pittsburgh, Pa.

The first C-1-B vessel recently completed at the Sparrows Point Plant of the Bethlehem Steel Company, and six C-3 Maritime Commission vessels now building on West Coast, have applied a unique drive for the windlass. Dual characteristics for the purpose of handling the anchors and warping the vessel are made possible by means of a single motor and controller. It is believed this is the first time such characteristics have been furnished by such means. Formerly electrical drives for the windlass have had either straight reversing or dynamic braking lowering circuits, but not both.

Transfer switches are provided to give automatically anchor handling motor and control characteristics when the windlass is used for anchor handling; and warping characteristics when used for warping. The changeover is made independently of the operator for the electric control. Only the proper mechanical set-up for the windlass need be made.

If practicable, the switches are actuated by the wildcat locking heads. If this is not practicable, the switches are actuated from the wildcat brakes.

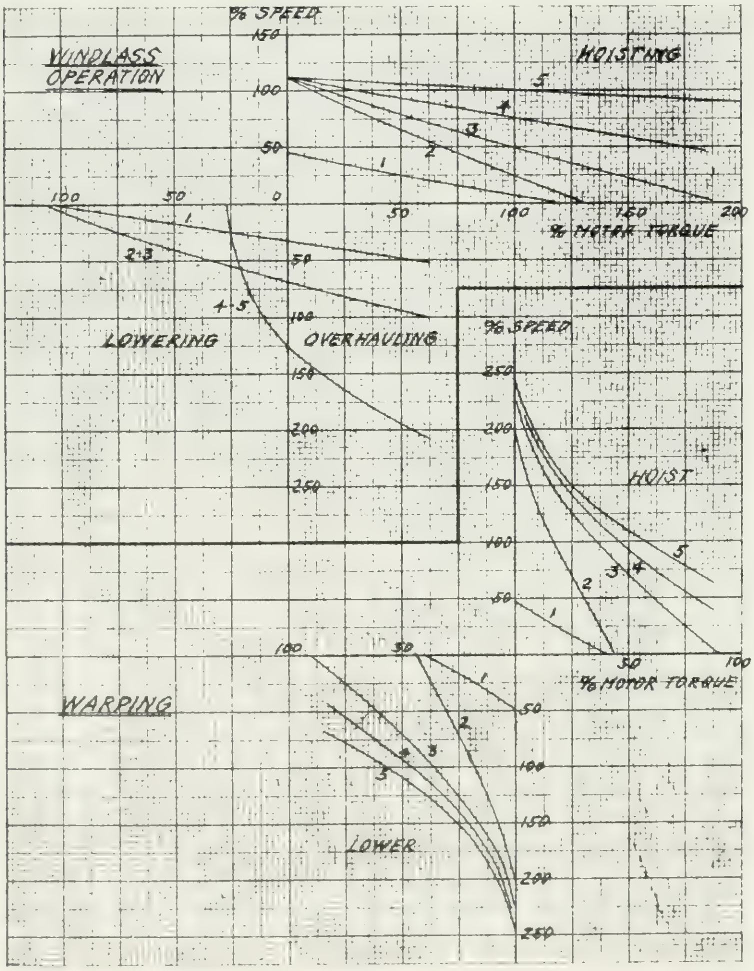
When the windlass is used for anchor handling, the motor control provides: not less than three speeds in each direction; adequate torque in the hoisting direction; dynamic braking of overhauling loads in the lowering direction; sufficient motoring torque in the lowering direction for prompt acceleration.

Two Anchors Hoisted Simultaneously

Two anchors, each from a depth of 30 fathoms of water, are hoisted simultaneously at not less than 30 feet per minute, when the overload on the motor is not more than 25 per cent.

The lowering of one anchor is effected at not more than 15 feet per minute at slow speed, not less than 45 feet per minute at high speed. Under no condition, when lowering both anchors under power, will the overhauling speed exceed the safe overspeed of the motor.

When the windlass is used for warping, the control is arranged so that the motor curves are substantially identical in both directions of rotation; not less than three speeds in each direction are provided; the line pull at either gypsy head is at least 20,000 lbs. at approximately 30 ft. per minute; the maximum line pull does not exceed 75 per cent of the breaking strength of



Motor characteristic curves for torque control windlass operation the 8½" warping hawser; and the slack line speed exceeds twice that for the rated line pull.

Controlled Windlass Operation

When lowering, a dynamic braking circuit through the series field is provided on all positions. Also series and parallel resistors are used on all positions. The motor shunt field is weakened on the 4-5 point so that a sharp increase in speed is brought about. However, despite this increased speed when lowering both anchors, a safe overspeed for the motor and windlass parts is not exceeded. Thus the drive and the personnel are protected, a condition not necessarily true when anchors are lowered under power on the straight reversing electrical circuit.

Warping Operation

The weakened shunt field and the armature series resistors limit the motor torques to values less than those obtained for anchor handling. Also, the weakened shunt field gives a high light line speed. For warping the motor curves are identical in both directions of rotation. Point one gives armature shunting. Point two opens this shunted connection. Points three and four reduce the value of the armature series resistance. On point five only a small amount of the series resistance is left in the circuit.

Action of the Jamming Relay

Only a part of the ampere turns of the jamming relay is effective in the circuit for windlass operation. Under this condition the relay is set to pick up at 160 per cent of normal current during hoisting. This will insert the armature series resistance limiting the torque to about 135 per cent of normal for standstill; i. e. operation along curve three, four or five has been returned to curve two at the point where this curve crosses the zero speed base line. If the torque decreases with corresponding reduction in current to about 90 per cent of normal, the step-back relay functions to permit the accelerating contactors to close in their regular definite-time sequence. When lowering the anchors, the line current is not high enough to trip the jamming relay.

The motor torques required for anchor handling are too great for safely handling the warping hawser. These torques will break the hawser in the event it is pulled too tightly around the gypsy head.

All of the ampere-turns of the jamming relay are effective in the circuit for the warping operation. Under this set-up, the relay trips if the motor is running in either direction (on curves three, four or five, and at a torque in excess of the value as set by the specifications. The step-back operation is to curve two, less than 50 per cent of the normal motor torque at standstill.

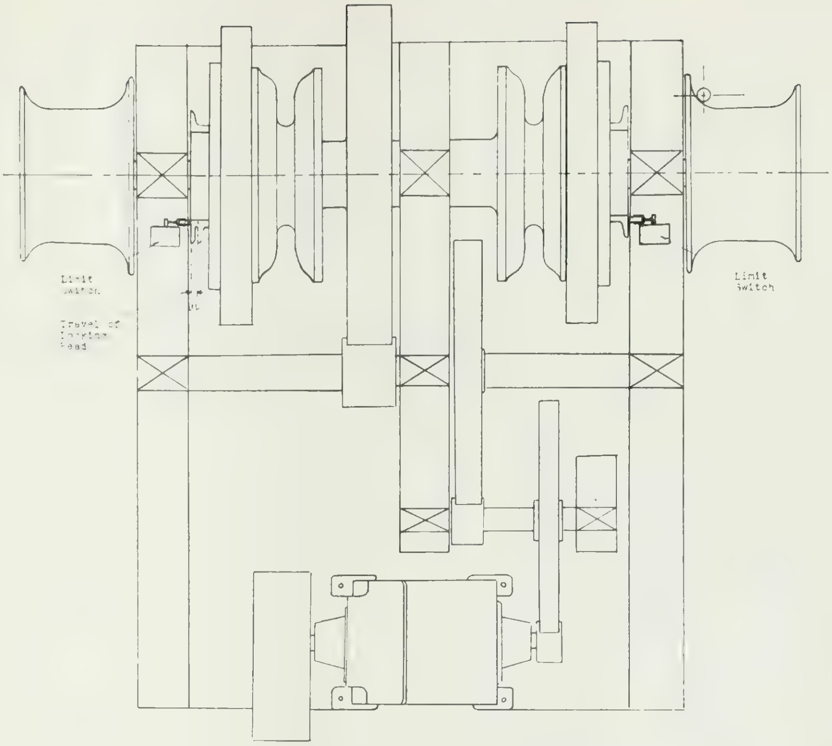


Diagram plan of typical windlass showing location of limit switches

Switches Select Proper Circuit

The automatic selection of the correct circuit to give either the windlass or warping operation is effected by means of interlock switches mounted on the windlass and properly protected.

The windlass characteristics will be secured when either or both wildcats are engaged, and the warping characteristics are effected only when both wildcats are disengaged. There are two methods of obtaining the differentiation between windlass and warping operations.

(a) Switch Used with Locking Device.

The operating lever of the interlock switch may be in the neutral position when the wildcat is locked and turned in either direction when the wildcat is unlocked. Also it may be necessary to mount the switch so that the arm is depressed when the wildcat is locked and in the neutral position when the wildcat is unlocked. Either make or break contact within the limit switch brings about the desired circuit connection for any possible mounting.

(b) Switch Used with Hand Brake.

When the switch cannot be operated conveniently by the locking device, it may be mounted near the handbrake so that the switch lever is operated by movement of the brake band or linkage. This method is valid on the assumption that the hand brake is always used to hold the wildcat when the latter is unlocked from the drive shaft.

If the power fails when the master controller is not in the off position, the self-generating dynamic braking circuit will close, the solenoid brake will set and the motor will stop.

This dual scheme for the windlass drives on recent U. S. Merchant Marine vessels is in the nature of a modern improvement. A single controller serves automatically the two purposes for which the drive is intended; i. e. to provide the dynamic braking circuit for windlass operation and the straight reversing circuit for warping.

News FROM THE PACIFIC NORTHWEST

by Daniel L. Pratt

As of April 15th

Expansion of Shipyards

The addition of over $20,000,000 worth of orders for new ships to Pacific Northwestern yards in the last thirty days, with other work undoubtedly in prospect, is not only taxing present shipbuilding facilities but also making necessary expansion of plants already overtaxed with work and plans just getting under way on new contracts.

The award of a new contract to the Tacoma plant of the Seattle-Tacoma Shipbuilding Corp. for five new navy tankers at a cost of $10,600,000, necessitates an immediate expansion of this already large institution to double its capacity. The first step, increasing the number of ways from two to four, is already under way, and, in order to make room for other plant expansion, the plant of Sizer & Co. on the Wapato waterway has been purchased. The size of shops and fabricating buildings will be increased, new fitting out wharf built and other facilities added.

It is also announced that three more shipways will be added to the plant of the **Oregon Shipbuilding Co.** in Portland, giving that yard a total of eleven ways instead of eight. This will give the plant sufficient capacity to launch 43 ships in the next two years, and in order to take care of expansion, the company has purchased the 11½-acre Miller tract adjoining the ways now built. It is expected that an order for 12 more ships will be added to those already ordered, probably of the so-called "Ugly Duckling" type being built for England.

Additions to the facilities of the **Associated Shipbuilders** yards on Harbor Island, which entailed practically the construction of a new plant, are now completed and the company is ready to lay its first keel. The **Seattle-Tacoma Shipbuilding Corp.,** Seattle plant, is now complete and already engaged in construction. The **Lake Washington Shipyards** at Houghton, near Seattle, is carrying on a $600,000 plant expansion and at the same time carrying on its immense shipbuilding program. The **Winslow Marine Railway & Shipbuilding Co.** is nearing completion on the conversion of ferries for the Black Ball Line and is planning a self-financed plant addition to take care of the $8,000,000 order it has received from the navy for four steel mine sweepers. Other shipyards receiving recent orders that will require additional building facilities are: **Albina Engine & Machine Works,** Portland, which will build four subchasers; **Commercial Iron Works,** Portland, seven minesweepers; **Astoria Marine Construction Co.,** which is considering acquiring the old McEachern yard to handle four minesweepers; **Kruse & Banks,** North Bend, Ore., four minesweepers; **J. M. Martinac Shipbuilding Co.,** Tacoma, four minesweepers; **Tacoma Boat Building Co.,** Tacoma, four minesweepers; **Western Boat Building Co.,** Tacoma, four minesweepers.

Army Terminal Enlarged

With the announcement by **Maj. R. H. Wylie,** quartermaster corps, San Francisco, that virtually all army supplies for Alaska will hereafter be shipped from Seattle instead of from San Francisco, comes a statement of plans to expend nearly five million dollars on the newly acquired army

Building several ships and at the same time expanding the plant makes Lake Washington Shipyards at Houghton, Wash., one of the busiest ship construction establishments in the Northwest quartermaster depot in Seattle and to make it a permanent base. Two million seven hundred fifty thousand dollars is needed for a new pier and transit shed and $2,000,000 more for a new storage house. The new pier will replace what is known as "Atlantic A" just north of the old Pacific Steamship pier at 1519 So. Alaskan Way, and it is expected that two warehouses will be built with a combined floor space of approximately a million square feet, one south of the old Pacific S. S. Co. pier and the other to the north, on a tract only recently taken over by the government. About a million dollars has already been spent on these terminals since the army acquired them last year. Stringent regulations have been put into effect for the protection of the new plant and a high steel fence has been built all around it. Major Wylie, when in Seattle recently, said that the army has at its disposal twelve transports on the coast, operated by civil service employees. By loading at Seattle instead of at both ports as heretofore, much time can be saved and an adequate stream of supplies can be kept flowing between the Sound and the army bases in Alaska.

Navy Leases Terminal

In order to provide the Navy with increased terminal facilities, it is announced that the eastern half of Pier 41 has been leased from the Port of Seattle. The additional berthing space and facilities acquired will be used as an operating base for all district traffic. A two-deck shed 500 x 100 feet is provided, giving large space for cargo storage of naval supplies, and the long, wide dockage facilities will be of great value to the Navy. It is hinted that the terminal may later be expanded into a section base similar to that of the Army. Because of this new arrangement, the **American Mail Line** will be forced to move its berthing facilities to the west side of Pier 41.

Seattle Builds New Dock

Keeping in step with the other terminal expansion along the Seattle waterfront necessitated by rapid military and commercial expansion, the **Port of Seattle** started driving test piles early in April in its waterfront tract at Alaskan Way and Connecticut Street, preliminary to consideration of its plan to build a new million-dollar terminal there. **Smith M. Wilson,** president of the Port Commission, stated that a law passed by the last Washington legislature will become effective in June permitting the port to issue improvement bonds to improve its property in connection with national defense needs. The increase of business caused by national defense activity, Wilson said, keeps their present terminals filled to capacity and another terminal is needed badly. A complete unit on this site, with piers and storage warehouses would cost about $5,500,000, but it is believed that an expenditure of about $1,000,000 would fill requirements for the present time.

New Oil Terminals

New oil terminals have been opened in Seattle recently for both the **Richfield Oil Co.** and the **Jobbers' Petroleum Co.** Using the new Richfield terminals for the first time, the tanker Pat Doheney arrived March 18th from Los Angeles and docked there. Although docking facilities are fully available, storage tanks and buildings on the ten-acre tract will not be completed, for several months. When completed, the terminal will include office and shipping supply headquarters and 20 storage tanks capable of holding 500,000 barrels (42 gal.). The Jobbers' Petroleum Co. plant was also used for the first time March 26th, when the tanker J. J. Coney tied up at the pier just inside the Lake Washington canal locks, where the plant is located. The terminal includes a two-story office building, storage facilities for 3,000,000 gallons of gasoline and a 500-foot pier. The Jobbers' Petroleum Co. is distributor for the Hancock Oil Co., and for some time has had a terminal in Tacoma. This plant has recently been greatly overtaxed, so that the new $350,000 Seattle plant was built to take care of an expanding business in that locality.

And Old Timer Celebrates

Capt. James Griffiths, head of James Griffiths & Sons, well-known Seattle steamship operator and shipbuilders, on March 19th, at a quiet family dinner, celebrated his 80th birthday. Capt. Griffiths was born in England in 1861 and came to Tacoma, Wash., in 1885, later moving to Port Townsend in 1888 and to Seattle in 1896. In point of years, he is probably the dean of all shipping men living on the coast. While his son, Stanley Griffiths, is acting as the executive head of the Griffiths interests, the captain still comes to his office every day and takes an active interest in the affairs of his various companies, which include the shipping concern of James Griffiths & Sons, the Winslow Marine Railway & Shipbuilding Co., Griffiths & Sprague Stevedoring Co., and other concerns. The shipping company at the present time is operating five vessels.

Marine Shorts

With nine, or more than half, of the ships taken for the Oriental trade, Pacific Coast charters during March totaled sixteen.

* * *

The Port of Portland dredge was towed to Hawaii by the tug **Seminole** the latter part of April, where she will be engaged at Pearl Harbor in defense work.

* * *

Many sturdy diesel fishing vessels were purchased last month by the Navy on Puget Sound and added to the long list already bought there for patrol duty. Practically all require minor changes and will be protected by small guns.

* * *

The **Commodore Shipping Co.** has been organized at Seattle to take over and operate the famous old schooner **Commodore** which, for some time past, has been used as a barge. Operations will be managed by the Olympic Steamship Co., after the boat has been rerigged and put in first class shape.

* * *

Ships of the **American Mail Line** will bring 200,000 cases of canned pineapples from the Philippine Islands to Seattle for transhipment to the East. They will be moved in lots of 75,000 cases and the first shipment will be in

(Page 72, please)

News FROM THE PACIFIC SOUTHWEST

by K. M. Walker

As of April 15th

Gambling Ship To Take Wings

The gambling ship Rex, now tied up in Newport Harbor, is to have the bulky gambling house removed and her decks cleared for deep-water service once more. Built in Port Glasgow, Scotland, in 1887, this four-masted steel ship was christened Kenilworth and was on the Liverpool-San Francisco run in the Waverly Line for two years, then operated by the Sewalls from 1890 to 1908 when she was transferred to the Alaska Packers Association and became the Star of Scotland.

She was ravaged by fire at least twice in her career as a square rigger: once in 1899 at Port Costa, after which she was sold to Arthur Sewall and Co. of Bath, Maine, who had her rebuilt as a four-masted bark by the Union Iron Works in San Francisco; and again on a voyage out of Honolulu for New York when, in the South Pacific, her sugar cargo took fire and her master, first mate and cabin boy were suffocated.

When, as the Star of Scotland, she was sold to a gambling syndicate, her lofty masts and spars were cut down, an ungainly wooden gambling house built the full length from forecastle to poop and extending out each side on wide sponsons, and she was renamed Rex. After two brief ventures as a gambling barge, anchored off the Southern California coast, she was towed into Newport Harbor where she has been the local eyesore. Now she is to be re-rigged as a five-masted schooner and will again be seen in Pacific Coast ports loading lumber, bringing in sugar from the Islands or nitrates from Chile or any of the multifarious burdens borne by the vanished fleet of coasting schooners, once so common on the West Coast.

"Star of India rears her graceful spars over the lumber piles"

Lumber Cargoes Set High Mark

Due to the unprecedented demand set up by the vast Government construction program and the increased domestic demand created by the heavy home building requirements, lumber receipts in the Port of San Diego are averaging better than ten million feet a month. With such heavy receipts a serious storage problem has come up and, in order to get the lumber schooners unloaded and away for another load, it has become necessary to close the wide Harbor Drive and use the boulevard space for a lumber storage yard. As a result traffic creeps in a trickle around stacked lumber while the big gasoline lumber "Hysters" wheel frantically in a futile effort to keep abreast of the sling loads coming out of the steam schooners.

This condition is not confined to a small area but includes all of the waterfront from the Municipal Center to Broadway and on the south side from a point near the Coronado Ferry docks to the Campbell Shipyard where the Star of India pokes her spars above the ever-growing lumber stacks.

Tualatin at San Pedro

The big steel suction dredge Tualatin, owned by the Hydraulic Dredging Company, was towed into San Pedro and put into position outside Terminal Island to dredge the new channel into the U. S. Navy graving dock under construction on the island. The Tualatin has been engaged in widening the San Diego Bay entrance channel by cutting off the westerly tip of North Island and removing the remains of the old Middleground Shoal.

New Shrimp Industry For San Diego

The Marine Products Company, for many years a tenant of the Municipal Pier No. 1, have moved into the former American Agar Company plant at Harasthy and Hancock Streets where, in addition to producing agar-agar from the Point Loma kelp beds under the name of American Agar and Chemical Company, they will install freezing and cold storage equipment to freeze 20 tons of shrimp daily and store 300 tons.

Lucian K. Small, president of the Marine Products Company, states that they have found that the Gulf of California shrimp are generally larger and of better flavor than the Gulf of Mexico shrimp and that this is a relatively new field. They plan to pack and ship approximately 4000 tons annually and will devote their sales efforts, for the time being, to the Pacific Coast markets. This is only a small part of the 50,000 tons of shrimp used annually in the United States, most of which is supplied by the Gulf of Mexico packers, but the better size and quality gives promise of increased demand in the future.

Intercoastal Shipping Problem Looms

With the growth of Southern California ports has come a corresponding growth in freight shipments on the intercoastal ships, instanced by the rise of an average of 300 tons dropped per ship calling in San Diego to an average of over 1000 tons, and a demand for more tonnage in this service. Now it is proposed to transfer coastwise and intercoastal ships to the highly essential overseas trade routes or possibly to the British flag. This would not alone deprive the port facilities, built up through long years of planning and hard struggle, of a large part of their business and make operation, with foreign shipments alone, profitless but would mean the diversion to the railroads of the major part of intercoastal cargoes. This would be difficult business to regain when the emergency is over and the prospect is causing considerable worry in the realm of ship and terminal operators.

This gloomy realization apparently stemmed from the meeting in Oakland during March of the Pacific Coast Advisory Board, in cooperation with the California Association of Port Authorities, when the problem of re-routing Oriental cargoes by rail across the United States instead of via the Panama Canal, as heretofore, was placed under consideration.

San Diego Waterfront Improvements

The Harbor Commission has under consideration the following proposals:

1. Construction of a pier at the foot of Tenth Street for general industrial purposes. This is becoming an acute need with the acquisition by the government of the present municipal piers for the use of the Navy.

2. Use of the bulkhead between Ninth and Columbia Streets as a quay by means of dredging the 3500-foot frontage. The development of more wharfage is necessary with the removal of existing pier facilities from public use.

3. Construction of a vehicular tube to connect San Diego and Coronado. It is expected that ferry interests will fight this proposition but the automobile traffic is too slow, with the waiting for boats and the necessarily slow run across the channel, for the present-day tempo of traffic.

New Los Angeles Shipyards

Terminal Island is humming with industry. Two large shipyards, a large Navy aviation training establishment and several boat builders' expansion projects have provided quite an army of construction mechanics with work. Practically none of these men live on Terminal Island and the morning and evening traffic jams are becoming very acute. A new highway approach is a very necessary improvement and the harbor boards of Los Angeles and Long Beach are seriously considering various projects. A sub-channel tunnel would seem to be the real answer, rather than another bridge.

The California Shipbuilding Corporation is constructing a six-way yard to build 24 emergency-type ships and will be working about 6000 men at peak. The Bethlehem yard, at the west end of the island, is putting in three or four ways for torpedo boats, of which they have ten under construction, and they, at peak, will also be working about 6000.

Consolidated Steel Corporation is very busy at the Craig yard on the mainland of Long Beach. Their first ship, the Cape Mendocino, is about ready for delivery and their second, the Agwiprince, is in the water.

Los Angeles Shipbuilding and Dry Dock Company is busily getting ready to push through the erection of three cargo fleet repair ships.

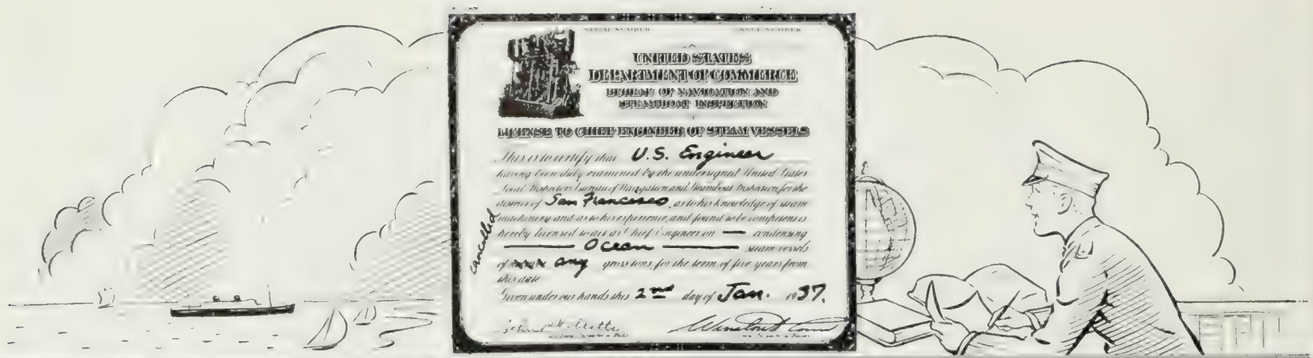
Yard Notes

The Martinolich Shipyard launched its first hull from the new San Diego yard on April 6. This vessel started out to be a tuna clipper for Manuel Machado, Jr., but, with a sister hull started at the same time, was taken over by the Navy and was redesigned as a minesweeper. Christened Rhea by Miss Marjorie Strong, daughter of Lt. Comdr. Ronald T. Strong, the vessel is a ninety-foot hull of unusual construction, being double planked and steel strapped.

* * *

The San Diego Marine Construction Company laid the keel for a tuna boat recently and has the vessel well in frame, but, unless the Navy casts covetous eyes on her, the construction is liable to lag as this, and the other boat yards, were ordered to give priority to the naval minesweeper construction and conversion plans. This yard has new contracts for four large mine sweepers to cost a total of $1,300,000 and which contract will tax their facilities and personnel to the limit. The yard is being enlarged to a certain extent by extending the east fence out into the area which appears as Harbor Drive on the City Development plans.

Lumber piles block the right of way on Harbor Drive, San Diego



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MARINE BOILERS

XIV—EFFICIENCY

QUESTION

What is the meaning of boiler efficiency?

ANSWER

A good boiler is more efficient, in many respects, than might be expected. But the meaning of "efficiency" is not so clearly understood or measured as with an electric machine or even an engine or turbine.

The general term efficiency means an expression of the effectiveness with which the machine or unit converts the energy put into it into that which is taken out. Thus for a boiler, the pounds of steam taken out per pound of oil put in would be a ratio, which expresses the efficiency of the boiler. However, this ratio is limited and inexact because it would vary for different oils, and for different steam conditions and temperatures of feed water.

There is only one correct way to express boiler effectiveness and that is to reduce both the input oil and output steam into the same unit which is common to both, and correct for water and air input. The losses should also be converted into this unit and checked.

QUESTION

To what common factor can all the elements entering into boiler efficiency be reduced?

ANSWER

Heat is the thing common to all inputs and all outputs of a boiler. The unit of heat is the British thermal unit, or Btu, which is the heat that will raise a pound of water one degree F., or, more exactly, the heat to raise a pound of water from 32° to 212° F. divided by 180.

QUESTION

What are some standard heat contents of elements entering boiler calculations?

ANSWER

Our heat unit can express the value of a fuel. Taking fuel oil, for instance, we find that it runs about 18,600 Btu per pound of oil, and varies from 18,-

Thermodynamics Next

Beginning with the June issue, we start a series on thermodynamics, the theory of heat. Without some practical knowledge of heat and its profound influence on our everyday life on the job, it is impossible to understand the meaning of and reasons for the changes going on in the marine steam and diesel plant.

Why raise pressures, temperatures, why reheat, why bleed steam from turbine and thousands of such questions cannot be answered by the simple statement—to increase efficiency. Only a knowledge of cycles and energy transfer can satisfy the intelligent engineer.

Further discussion on boilers now would be incomplete without thermodynamics. We could describe the air heaters, economizers, superheaters, high temperatures, reheaters and feed heaters in vain without heat theory.

It will be difficult going at first, but we promise the reader that if he carries on through the start that a glimpse of the marvels, the scientific beauty, the all-inclusive extent of thermodynamics will both delight and satisfy the curious engineer.

The pursuit of this subject customarily is open only to those attending colleges or special schools and is considered by most as the "toughest" course offered.

THE CHIEF.

000 to 19,000 Btu, but 18,600 is the standard to use unless the exact value is known.

Also the heat in the steam is known from the steam tables since water at 32° F. is taken as zero, and at 212° F. as 180 Btu per pound.

Similarly, the heat in the feed and the air in, or the stack gases out, can be expressed.

QUESTION

How do we compute efficiency on a heat content per pound basis?

ANSWER

We charge the boiler with the heat in the oil, the heat in the feed water, the heat in the intake air, not including the heat in the air furnished by combustion in the boiler itself. We credit the boiler with the heat in the steam out. Then efficiency expressed as a decimal is $\frac{\text{output Btu}}{\text{input Btu}}$ or multiply by 100 to get the per cent efficiency.

QUESTION

How is the boiler efficiency tested?

ANSWER

It is a rather difficult and elaborate test to actually measure the efficiency of a boiler. Many readings must be taken half hourly over a twelve-hour run or better. Some of the data to be taken are:

(a) Quantities or flow rate of all factors.

(b) Temperature and quality of fuel.

(c) Humidity and temperature of air.

(d) Feed temperature.

(e) Combustion air temperature and flow.

(f) Stack gas temperature, CO_2 and CO content.

(g) Steam temperature, steam pressure and many other factors.

QUESTION

Is there any rough, simple method of estimating boiler efficiency?

ANSWER

This puts the study, or even rough tests of boiler efficiency, beyond the possibility of the marine operating engineer. However, there is a method by which the operating engineer can watch his boiler efficiency. It is based on the general truth that if there were no losses the output would be equal to the input, and by studying losses and subtracting them from the input, we get the output and can calculate the efficiency.

QUESTION

What are the boiler losses?

ANSWER

The losses are principally in the combustion and escape out the stack. Radiation heat losses are also important.

QUESTION

What is excess air?

ANSWER

Combustion losses in burning oil are in general due to either too much air or too little air. The air delivery must be exactly proportional to the oil feed. If too much air, the excess air must be heated by the flame and passes on to stack, cooling the hot gas in the furnace and wasting to stack. Excess air is very deleterious and wasteful.

QUESTION

What is the result of lack in air supply?

ANSWER

Air deficiency is also wasteful. Complete combustion converts all the carbon in the oil to carbon dioxide (CO_2) the natural ash or product of combustion of hydro-carbons such as oil. If there is a lack of air, the oxygen in the air will be used up before all the carbon is oxidized into CO_2. Partially oxidized carbon is CO, a poisonous gas, odorless, colorless but lethal. It burns with a bluish hot flame into CO_2 if additional oxygen is available, and is raised to 700 or 800° F. for ignition. This accounts for the fact that if a flame is cooled by contact with a water cooled surface the gas is lowered below the ignition temperature of CO before it burns and we have only a partly burned fuel.

QUESTION

What is the short method for estimating boiler performance?

ANSWER

If allowances are made for the various losses such as radiation, fuel chemistry, and a good boiler design is involved, it seems reasonable that by knowing only stack temperature and CO_2 per cent we could calculate excess air and boiler losses, thus efficiency. Knowing the fuel, its carbon content per pound, and air and its carbon content per pound, we may calculate the per cent of CO_2 in the combustion gas.

For oil the percentage runs around 14.5 to 16 depending on the oil. Good California oil should show 16 per cent on perfect combustion. Experience has shown that it is impossible to run a furnace at this figure because of the

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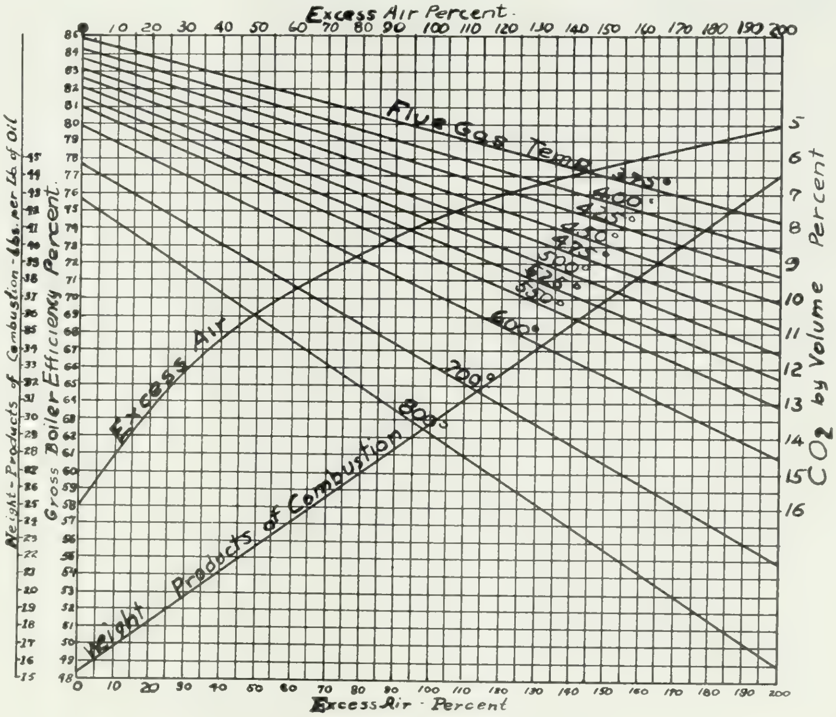

Chart for estimating boiler performance

Steady as you go!

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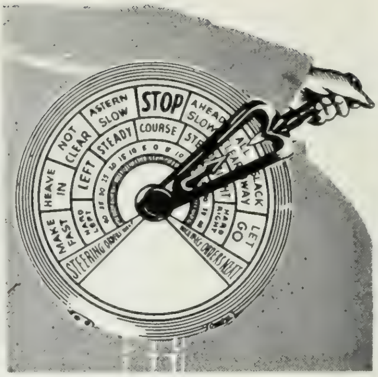


A Department for Deck Officers

by "The Skipper"

Questions Welcomed. Just Address "The Skipper," Pacific Marine Review, 500 Sansome Street, San Francisco, California

MANILA ROPE

II—BLOCKS AND TACKLES

QUESTION

How much leverage is obtained by multiplying the parts in blocks and falls?

ANSWER

This depends on a great many variables such as: the friction in the blocks which may be due to tightness or rope fit, lack of lubrication in bearings, or twisting of the falls; the sequence of reeving rope through blocks; or the way in which blocks are hung and power applied.

In general, with clean, properly lubricated blocks of adequate diameter and clearance, hung to the best advantage and with a straight lift, the leverage gained will be approximately twice the number of parts plus 1. For example, a three part purchase or two triple blocks would give a lift of seven times the pull on the hauling part. Another simple rule is that the leverage gain is equal to the number of rope parts at the moving block or blocks.

QUESTION

What are the mechanical principles which govern the use of tackles?

ANSWER

A tackle is any combination of rope and blocks by which force is gained in lifting weights or pulling against resistance. The most simple and the most ancient machines of which man makes use are the block, the wheel and axle, the lever and the wedge. All modern mechanical machines are composed of combinations or adaptations of one or more of these simple appliances.

Figure 2 illustrates several applications of simple tackles to weight lifting. In each case, the pull at P is one pound and that pull, assuming the blocks to be without friction, will balance or lift the weights as marked in the illustration.

It will be noted that in each case the ratio of gain is the number of parts of the rope at the moving block or blocks.

If now we raise the spring balance by a pull, we find it still registers one pound (disregarding friction) in each case but there are different distances moved by the weight. For one foot movement of the one pound pull, we get results as follows: on the fixed one-sheave block, the one pound weight raises one foot; on the moving one-sheave block, the two pound weight raises six inches; on the two moving one-sheave blocks and on the one moving two-sheave block, the four pound weight moves three inches.

This perfectly illustrates the maxim that no mechanism creates energy or power. The work imparted to the rope by your pull is equal (disregarding friction) to the work imparted to the weight by the rope. Work, in the mechanical sense, is a product of force multiplied by movement and is measured in foot-pounds. Thus, in the four part purchase, the movement of P through one foot requires one foot-pound of work. The movement of four pounds through 3″ or ¼ foot also requires one foot-pound of work.

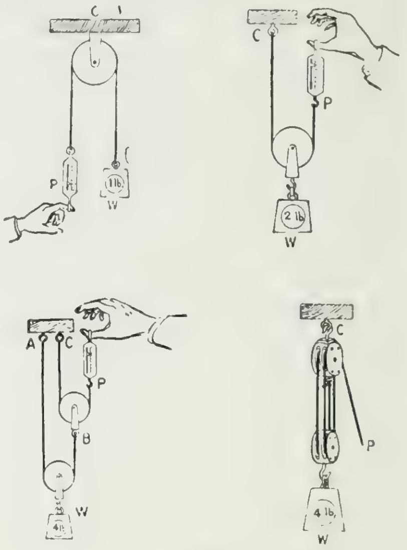


Fig. 2

This simple illustration shows that if a tackle or any mechanism makes a gain in one factor of work it always loses in the other factor. Gain of force always means loss in distance or speed, with equal work or power supplied by the source.

QUESTION

What are the principal tackles used at sea?

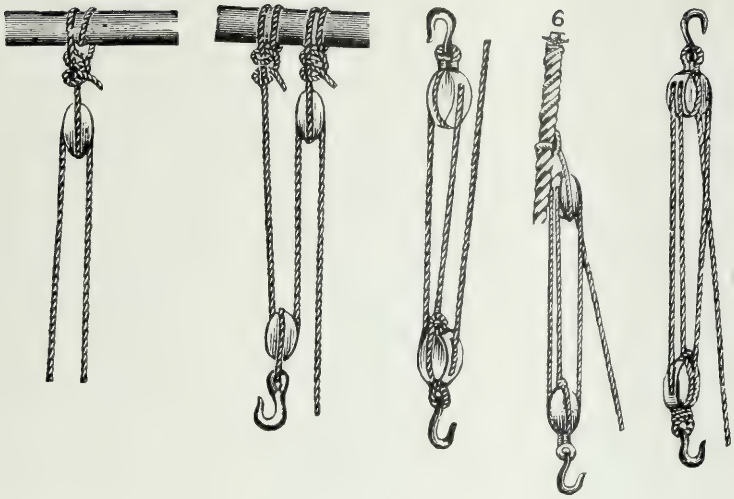


Fig. 3

ANSWER

In Figures 3-5 we illustrate the tackles most frequently used. The names of these tackles and their gains are listed below.

Figure 3 left to right:

Single Whip—Gain only in height of lift or change in direction of pull.

Double Whip—Two single blocks, one fixed, one moving. Double force gained.

Gun Tackle—Two single blocks. If lower block is movable, triple force is gained. If upper block is movable, double force is gained.

Handy Billy—A double block with a tail and a single block with hook. Force gained triple.

Luff Tackle—A double hook-block and a single hook-block. Force gained three if single block is movable, four if double block is movable.

Figure 4 left to right:

Double Tackle—Two double sheave hook-blocks. Force gained four or five, depending on manner of application.

Triple Tackle—Two three-sheave hook-blocks. Force gained six or seven.

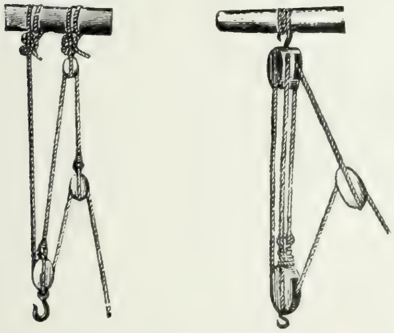


Fig. 5

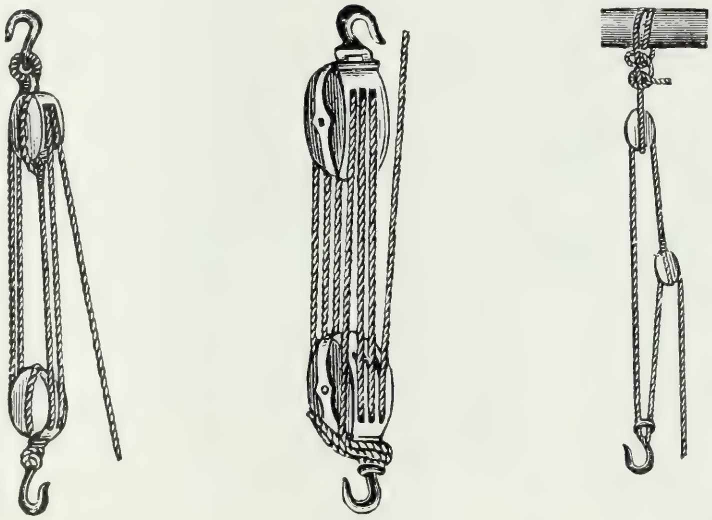


Fig. 4

Single Spanish Burton—Two single sheave blocks and a hook. Force gained three times.

Figure 5:

Two forms of double Spanish Burton—First form uses three single blocks, as shown; second form uses one double block and two single blocks. Force gained in either case is five times. Spanish Burtons have the disadvantage that the whip block travels down as the lower block comes up and this limits the movement of the lower block to less than half that allowed by the other described tackles.

QUESTION

What is the best way to run a rope through blocks?

ANSWER

To get best results in a tackle, the rope should be run or rove through a multiple part block so that the hauling and the standing parts of the rope come in the middle sheave holes. Directions for this process are to be found in all books on seamanship. Here is one from Nicholls's "Seamanship and Nautical Knowledge," which tells us the best method of getting this result with a triple tackle.

"Place the two blocks on deck with the tails of the blocks towards each other. The one to take the hauling and standing parts of the fall should have a good becket or eye in the tail, and should be laid on its edge having the swallows up and down. (Call this No. 1 block.) The other one should be laid on its cheek having the swallows parallel to the deck. Lay the blocks close together and stand in line with them, having No. 1 furthest away from you.

"Take the end of the fall from the coil and reeve it downwards through the middle sheavehole of No. 1 block, then from right to left through the lower sheavehold of the other block, then upwards through the left hand sheavehole of No. 1 block, and from left to right through the top sheavehole in the other block.

"You should not go wrong now as there is only one vacant sheavehole in No. 1 block (the right hand one). Reeve downwards through this, then from right to left through the middle sheavehole in the other block, making the end fast to the tail of No. 1 block."

Illustrations used in this article are from Nicholls's "Seamanship and Nautical Knowledge."

Motorship Cape Alava

(Continued from page 43)

made an integral part of the double bottom structure.

The Builders

The record time in which the Cape Alava was built by the Seattle-Tacoma Shipbuilding Corp. is all the more remarkable when it is considered that the builders were also engaged part of the time in finishing a new shipyard. It was only 11 months from the time that ground was broken for the Tacoma plant, on the site of the old Todd plant of World War days, until the launching of the Cape Alava took place. R. J. Lamont, president of the company, gives all the credit to Walter L. Green, vice-president of the company and general manager of the Tacoma plant, Charles D. Gillet, the chief engineer, and a loyal staff of assistants who accomplished the job so thoroughly and expeditiously.

At the same time that Cape Alava was being built, work has been going forward on the four other C-1-B vessels and other types under contract. Four out of the five C-1-Bs have already been launched, the last one being the Cape Fairweather on April 9th. Cape Flattery is almost ready for delivery and Cape Cleare is coming up The Tacoma yard is also building six C-3 steamers and has recently taken a contract for five big naval tankers to cost about $2,250,000 each. The Seattle yard of the company, just finished, has a contract for $175,000,000 worth of destroyers.

The Operators

When the Cape Alava sailed from Seattle on her first trip to the Orient, the event marked a new milestone in the long history of Puget Sound-Oriental commerce, as being the first of eight, modern, fast vessels which will be operated on this run by the American Mail Lines. The reorganization of this company, which had been out of business during 1938 and 1939, thus depriving North Pacific ports of an American-owned line to the Orient, made possible only a year ago, the resumption of service on this important trade route. The company with two motorships and four turbine vessels allocated to them by the Maritime Commission with the promise of the newer vessels, two C-1-Bs and six C-2s, as soon as they could be completed.

Pilot house on Motorship Cape Alava

With the reorganization of the American Mail Lines, the company passed entirely under the control of Pacific Northwest owners and operators. The present officers are:

Lawrence Calvert, Seattle, president; Earl D. Doran, Seattle, A. R. Lintner, Seattle, Ross McIntyre, Portland and Richard J. Reynolds of Winston-Salem, N. C., vice-presidents; S. L. Barnes of Seattle, secretary; R. B. Bush, Seattle, assistant secretary and treasurer; W. L. Williams, Seattle, assistant secretary; and H. G. Rowland, Seattle, assistant treasurer.

Directors: S. L. Barnes, chairman of the board, Lawrence Calvert, Earl S. Doran, T. F. Gleed, Andrew Sters (all of Seattle); Ross McIntyre and J. S. Campbell of Portland; Ralph Shaffer of Tacoma; Richard J. Reynolds of Winston-Salem.

Pacific Northwest News

(Continued from page 65)

June. This is the first Philippine canned pineapple ever shipped to Puget Sound. Singapore pineapple has also been arriving in Vancouver, B. C., in American Mail vessels for transshipment to Eastern Canada.

Short Shorts

Lake Union Drydocks, Seattle, will repair the U. S. Survey ship **J. B. Cavanaugh** at a cost of $8,618 . . . **Albina Engine Works** of Portland will repair the **U. S. Dredge Pacific** at a cost of $10,327 . . . Chartering of the **Mary D.** and the motorship **Clivedon** by the **Alaska Line** from the **Pacific American Fisheries** is announced . . . The **Foss** tugboat **Justine** is en route on a 4,325-mile voyage to Midway Island, where she will remain for a year aiding in the construction of a new airbase . . . The old windjammer **W. H. Smith** has been sold by the **Alaska Salmon Co.** to eastern interests. The same people also acquired the aged sailing ships **Tango** and **Rex** . . . U. S. Army engineers do not favor a proposal to improve the Columbia River and create a port at North Bonneville, Wash., feeling that traffic development does not warrant it.

Personal Gleanings

Sale of the **Ruth Alexander** to Wallem & Co. of Shanghai brought to the mind of many mariners on the Coast **Capt. Fred I. Nystrom,** who for so many years commanded her. Capt. Nystrom is now in command of the **Admiral Williams,** a freighter operating from British Columbia ports to Mexico, the South Seas and Australia. . . . **John Barthrop,** former district freight agent of the **McCor-**

mick Steamship Co., who entered the army as a lieutenant reservist in the Coast Artillery, already has been promoted to the rank of captain . . . **Oscar E. Olson,** formerly partner in the **Olson & Sunde Marine Works,** has retired from the firm and has formed a new partnership with **Carl B. Winge.** The firm is working on navy conversion contracts and has also made proposals for the construction of minesweepers . . . **John L. Moore** has been appointed general agent for the **American Mail Line** in Tacoma. Moore has been president of the J. L. Moore Shipping Co., an agency firm . . . **Roy S. Wintemute,** formerly at Seattle as vice president of the **General Steamship Corporation,** has accepted a position as manager of the **Siegfried Olson Line's** steamship department. . . . **Capt. George Conway,** Columbia River bar pilot, told the Oregon pilot commission that faulty steering apparatus and slowness of the crew in understanding his orders caused the grounding of the **Vazlav Vorovsky** on Peacock Spit . . . **John Carmoda,** executive assistant to the vice president of the **American Mail Line,** officially took delivery of the Cape Alava for the company when she was formally turned over at Tacoma by the **Seattle-Tacoma Shipbuilding Corp.** Present also for the American Mail were **F. H. Howard,** port superintendent, and **Capt. John Smith** who will command the vessel.

Gas-Freeing Cargo Tanks

(Continued from page 55)

tion and turbulence created by the exhauster is sufficient to vaporize the small amount of liquid left at the bottom and wetting the tank walls. After the air has been renovated a sufficient number of times (three to five, according to the condition of the plates and the type of product), a man can enter the tank and complete the job by giving a final cleaning with the broom. If any liquid is left on the bottom, it is swept toward the bellmouth, where it will rapidly evaporate, due to the suction of the exhauster, which in the meantime is kept in continuous operation.

Safety

The oil industry is static electricity conscious, and it is well known that static electricity can be generated by a high velocity steam jet. It is, therefore, logical to question the safety angle with reference to the use of a steam jet exhauster on board an oil tanker. Authoritative sources discount the possibility of the creation of static charges in the conditions existing in such an installation.

The separation of electric charges would occur the moment the steam leaves the nozzle. No charge could accumulate on the exhauster, on account of the impingement of steam on the diffuser, because the exhauster itself is grounded through the connecting piping. A charge could theoretically be accumulated on an insulated object directly in the path of the steam. But the insulation should be so good that it is extremely doubtful that such a condition could come to exist. The only object which could possibly be in the path of the jet is the hand rail, and, usually, even this is cleared by the jet because of the greater height of the exhauster. If past performance has any value, the 100 per cent safety record of the existing installation should speak for itself. As a matter of fact the exhauster method of gas-freeing is rapidly being accepted in other branches of the oil industry as, for instance, for the cleaning of storage tanks, of truck tanks or fractionating towers. The method is so convenient that when steam is not available, compressed air is at times used with equally satisfactory results.

* * *

Problems Answered

(Continued from page 69)

inability to present all the available carbon to all the available oxygen while they are both hot in the flame. Some carbon or CO is bound to escape the flame envelope or some unused oxygen will get away, and, of course, when cooled to hot gas temperatures, they will not unite. Thus, to avoid unused oxygen and excess, it is best to operate the stack gases at 14 to 14.5 per cent CO_2. This will mean a minimum of CO and of excess air.

Then, if we hold the optimum per cent CO_2, and keep the stack temperature to a minimum practical value, we have the best efficiency possible.

As stack temperature goes up or CO_2 goes down, the efficiency goes down. This explains why modern plants have an instrument to indicate or apparatus to measure CO_2 per cent and stack thermometers.

The accompanying chart has been prepared to correlate these several factors into terms of efficiency and also to indicate the excess air in per cent and weight of stack gas per pound of fuel burned.

This chart assumes a reasonably efficient boiler, with air in at blowers of 100° F., humidity of 80 per cent relative and fuel temperature normal. Reasonable allowances are made for radiation and unaccountable losses of approximately 4 per cent. The fuel oil is assumed to be 18,600 Btu per pound, having the following analysis:

Carbon	88%
Hydrogen	10.75%
Sulphur	.75%
Nitrogen	.25%
Oxygen	.25%

To use this chart, measure stack temperature and CO_2 per cent. Enter chart at the CO_2 scale at the right, say 10 per cent. Follow this line horizontally to the left until it intersects the excess air curve, about 60 per cent in this case. Then move vertically, either up or down, to the proper diagonal line marked flue gas temperature, say 525° F. for this case. Then move to the left horizontally to the left hand scale marked boiler efficiency and read per cent efficiency.

This chart could not be used for coal or for oil varying too widely from a standard marine fuel oil.

It is of value to study this chart and note how the efficiency varies with stack temperature and that this variation increases rapidly as we have not only high stack temperature but also excess air. This chart does not cover the excess fuel or black smoke conditions, as some measure of the weight of unburned carbon would have to be made.

On the Ways - SHIPS IN THE MAKING

LATEST NEWS FROM AMERICAN SHIPYARDS

Five Bulk Cargo Carriers

Contracts for the construction of five bulk ore freighters, largest ever built on the Great Lakes, have been announced by A. H. Ferbert, president of the Pittsburgh Steamship Co. (U. S. Steel subsidiary). Three of the vessels will be built by the Great Lakes Engineering Works, River Rouge, Mich., and two by the American Shipbuilding Co., Lorain, Ohio.

The following are the principal characteristics:

Length overall	640′
Length on keel	614′
Breadth	67′
Depth	35′
Draft, loaded (maximum)	23′10″
Cargo capacity, maximum	17,500 tons

Propulsion will be through a single screw driven by double reduction geared turbines developing a normal shp of 4000 at 90 rpm and a maximum of 4400 shp at 93 rpm. Loaded speed in deep water will be about 13 mph. Steam at the throttle will be 400 psi pressure and 750° F. with a vacuum of 28½ in. Two water tube boilers, coal fired by mechanical spreader type stokers and equipped with full automatic combustion control will generate the steam.

Auxiliaries and deck machinery will be electrically driven. Light and auxiliary power will be furnished by two 325 kw turbo-generators having the same steam conditions as the main unit.

RECAPITULATION OF CONSTRUCTION CONTRACTS IN EXISTENCE APRIL 1st 1941 AS TO TYPE AND PROPELLING POWER

Type	No.	Gross Tons (Est.)	Steam		Turbo-Electric		Diesel		Diesel Electric	
			No.	H. P.	No.	H. P.	No.	H. P.	No.	H. P.
Cargo	362	2,523,680	335	1,132,000	—	—	27	141,400	—	—
Passenger	25	223,600	21	177,800	—	—	4	34,000	—	—
Tanker	69	658,460	58	414,900	4	20,000	7	34,300	—	—
Tug	26	4,675	3	3,000	—	—	23	17,920	—	—
Towboat	10	3,710	1	1,500	—	—	9	9,152	—	—
Ferry	2	2,240	—	—	—	—	—	—	2	1,900
Mine Layer	8	6,560	8	12,000	—	—	—	—	—	—
Trawler	7	2,090	—	—	—	—	7	4,475	—	—
Survey Vessel	2	1,480	1	2,000	—	—	1	300	—	—
Work Boat	1	30	—	—	—	—	1	100	—	—
Hopper Barge	23	8,625	—	—	—	—	—	—	—	—
Oil Barge	19	9,750	—	—	—	—	—	—	—	—
Cargo Barge	48	25,755	—	—	—	—	—	—	—	—
Coal Barge	2	730	—	—	—	—	—	—	—	—
Dredge	1	1,800	—	—	—	—	—	—	—	—
Yacht	1	40	—	—	—	—	—	—	—	—
Totals	606	3,473,225	425	1,743,200	4	20,000	79	241,647	2	1,900

Self-Propelled Vessels — 512 — 3,426,525 gross tons — 2,006,747 H. P.
Non-Propelled Vessels — 94 — 46,700 gross tons

New Ways For Emergency Ships

Contracts for 32 of the 56 ways, authorized in the program announced by the President on April 4, to build ships under provisions of the Lend-Lease Bill, have been awarded by the Maritime Commission and cleared with the Office of Production Management, it was announced by the Maritime Commission April 16.

These 32 new ways are to be located in eight existing shipyards on both ocean coasts and the Gulf Coast.

Name and Place	*No. of Ways*
California Shipbuilding Corp. Los Angeles, Calif.	6
Oregon Shipbuilding Corp. Portland, Ore.	3
Richmond Shipbuilding Corp. Richmond, Calif.	6
Houston Shipbuilding Corp. Houston, Texas	3
North Carolina Shipbuilding Corp. Wilmington, N. C.	3
Bethlehem-Fairfield Shipyard, Inc. Baltimore, Md.	3
Seattle-Tacoma Shipbuilding Corp. Tacoma, Wash.	5
Pennsylvania Shipyards, Inc. Beaumont, Texas	3

Five Tankers for Tacoma

The Seattle-Tacoma Shipbuilding Corporation, Tacoma, Washington, was awarded a contract April 7 by the Navy Department for the construction of five twin screw, diesel-propelled gasoline tankers. This contract was let on a cost-plus-fixed fee basis, the estimated cost per vessel being $2,000,000 exclusive of the fixed fee of $120,000 per ship. The tankers will be 309′6″ overall, about 2300 dwt and will have a speed of 14 knots.

Huge Order for Emergency Ships

Contracts for 184 ships to cost approximately $364,800,000 have been awarded by the Maritime Commission and cleared with the Office of Production Management, it was announced by the Commission April 18. These transactions by the Commission complete within two weeks of the date of the announcement by the President of the second emergency 212-ship program, the arrangements for the building of the necessary shipyard facilities and the bulk of the ships.

Of the 184 vessels, 112 are of the emergency type of cargo carrier of approximately 10,000 dwt. Under the first emergency program, 200 of this same type have been ordered.

The other 72 ships included in the awards announced recently are single-screw high-speed, Commission-designed tankers of 16,000 dwt to be constructed by the Sun Shipbuilding and Dry Dock Company, Chester, Pennsylvania, and to cost approximately $180,000,000. [Ed. Note—This is one of the largest single contracts let for this type of ship in the history of the industry.]

Contracts for the 112 emergency cargo carriers, to cost approximately $184,800,000, were awarded as follows:

Company	*No. of Ships*	*Contract Cost*
So. Portland Shipbuilding Corp., So. Portland, Me.	16	$26,400,000
Bethlehem-Fairfield Shipyard, Baltimore, Md....	12	19,800,000
No. Carolina Shipbuilding Co., Wilmington, N. C..	12	19,800,000
Houston Shipbuilding Corp., Houston, Texas.	12	19,800,000
California Shipbuilding Corp., Los Angeles, Cal.	24	39,600,000
Richmond Shipbuilding Corp., Richmond, Cal..	24	39,600,000
Oregon Shipbuilding Corp., Portland, Ore.	12	19,800,000

G. E. Turbine Production Ahead of Schedule

Production of turbines, vital to defense for propulsion of merchant and naval vessels as well as the generation of electric power on land, is ahead of schedule at General Electric, it was disclosed by Charles E. Wilson, president, at the conclusion of the company's annual stockholders' meeting at Schenectady, April 15.

Mr. Wilson also said that the company is up to schedule on a large share of its other production.

At the stockholders' meeting, he announced that the company had $500,000,000 worth of orders on hand, three-quarters of which are for national defense.

Mr. Wilson stated that there were 105,000 employees on the company's payroll as of April 15, and that more were being added at the rate of 1,000 per week. There are more employees on the company's payroll now than at any time in its history.

The turbines which G-E manufactures for ship propulsion deliver in some cases more than 50,000 horsepower each. The company also manufactures the reduction gears, some of which weigh as much as 70,000 pounds and measure up to 18 feet in diameter, for the marine propulsion sets.

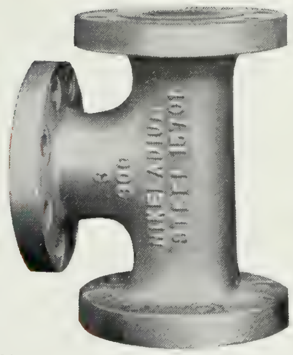
Coast Guard Opens Bids for Cutters

A single bid on a fixed price basis was received at Coast Guard Headquarters upon the opening of bids for the construction of three 327-foot cutters of a type similar to the largest cutters now in service. This bid, in the amount of $4,362,000 for each cutter, was submitted by the Bath Iron Works Corporation, of Bath, Maine, the time for delivery being 41 months. The Pusey and Jones Corporation, of Wilmington, Delaware, while not bidding on a fixed price basis, submitted an estimate of $3,625,200 per ship. They would require 28 months for the construction of one vessel, 31 months for the construction of 2 and 36 months for the construction of 3 vessels.

The Bath Iron Works also submitted with their fixed price bid, an estimate of $4,062,000 per ship, on an adjusted price basis.

The 327 foot cutters, for which the Coast Guard solicited bids, will be steel ships of 2,216 tons displacement, engines of 6,500 shaft horsepower, and with a draft of about 12 feet. The vessels will be practically identical with the seven largest cutters which the Service now operates on ocean going duties.

It Pays to Use



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Ingalls Delivers Mormactide

The Mormactide, Moore-McCormack Line's freighter, is the latest vessel out of The Ingalls Shipbuilding Corporation's Pascagoula, Mississippi, yard and the third to be completed by this company under United States Maritime Commission contract. She was launched October 12, 1940 and was delivered about the middle of April.

The Mormactide is similar in size, design and engine-power to the other ships turned out at Pascagoula, being of the new all-welded type of construction with double reduction geared steam turbine, single screw drive. She is expected to match the record set up by the Mormacmoon, which in a 25-hour run made 483 miles, or a 19.3 knot average. Between Montevideo and Trinidad, a distance of 4,151 miles, the Mormacmoon averaged 17.9 knots on 28′4″ draft, and used .908 barrel of fuel oil per mile. This fuel consumption compares favorably with that of other C-3 type Maritime Commission vessels.

The Mormactide is the second in the South American trade equipped with a cargo air-conditioning system. Of the Maritime Commission's C-3 design, she is 492 feet overall, with a beam of 69′6″ and a depth of 33′6″. She is of 12,510 deadweight tons, 7,753 gross tons, and has a cargo capacity of 720,000 bale cubic feet including 40,000 feet of refrigerated space. Accommodations are provided for 12 passengers.

All-welded hull cargo steamer Mormactide

The designed sea speed is 16½ knots, although almost a knot and a half more was developed continuously in loaded condition on the sister ship's maiden voyage. It is estimated that the Mormactide made a speed of 20.6 knots, when developing 10,480 shp on her recent trial trip.

Steam Engines for 312 Standardized Ships

Contracts for virtually all of the propulsion engines for 312 standardized cargo ships to be built under the emergency program of the United States Maritime Commission have been awarded.

These engines are of the triple-expansion reciprocating type with an indicated 2500 horsepower, which will give the cargo ships a normal speed of 10 to 11 knots.

Contracts provide for delivery of the engines at stated intervals throughout an 18-month period. Contracts are still pending with one or two other manufacturers.

Plants to which contracts have been awarded are: Alabama Marine Engine Co., Birmingham, Alabama, 12 engines; Harrisburg Foundry and Machinery Co., Harrisburg, Pennsylvania, 20; Astoria Marine Iron Works, Astoria, Oregon, 10; General Machinery Corp. (Hooven, Owens & Rentschler Co.), Hamilton, Ohio, 60; Worthington Pump and Machinery Co., Harrison, New Jersey, 36; Filer & Stowell Co., Milwaukee, Wisconsin, 12; Joshua Hendy Iron Works, Sunnyvale, California, 112; Ellicott Machine Corp., Baltimore, Maryland, 20; Toledo Shipbuilding Corp., Toledo, Ohio, 6; Clark Bros., Olean, New York, 14. Total 302.

Under the Emergency Shipbuilding Division of the Commission, there are being constructed the 200 ships included in the original program and the 112 additional authorized by the President for construction for Great Britain. This does not include 60 ships for which the British Government has contracted directly with American shipbuilders.

The original 200 ships are to be constructed on 51 ways in seven new shipyards which are already far along in process of building. The additional 112, according to the Commission's plans, are to be constructed on shipways to be added to these new yards insofar as possible.

Dutch Indies Order Enterprise Engines

The Netherland Indies government has ordered twenty-nine marine diesel engines from the Enterprise Engine and Foundry Company of San Francisco, it was announced by Charles G. Cox, vice president and sales manager of the Company. Totaling 18,680 hp, the engines will include:

Ten Type DMG-6 400 hp for mine sweepers.

Two Type DMG-6 400 hp for small hopper dredge.

One Type DML-6 180 hp for coastal survey boat.

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**GENERAL ENGINEERING
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Two Type DMG-6 750 hp for government transport and inspection boat.

Six Type DSX-6 300 hp generating sets for large mine sweeeper auxiliaries.

Two Type DMG-36 1000 hp for seagoing hopper dredge.

Six Type DMG-38 1400 hp for patrol vessels.

This is the first major machinery contract placed in the United States for diesel engine equipment by the Netherland Indies government. Hitherto all such orders were placed in Europe.

The Foss Launch and Tug Co. in Tacoma has purchased a Type DMQ-6 750 hp, a DMG-8 500 hp and a DMG-6 300 hp Enterprise diesels for installation in new vessels and replacements in existing boats.

Trials were completed during the first week in April on the installation of a new Type DMG-6 300 hp Enterprise Diesel in the tug, Equator, of the Puget Sound Tug & Barge Co., Seattle. Installation and trials have also been completed on a new Type DMW-6 240 hp Enterprise Diesel in the tug, Marion, of the San Francisco Towing Co., and the vessel has been put into regular service for gasoline barge towing between Sacramento and San Francisco.

Floating Dry Dock For Coast Guard

A contract has been awarded for the construction and installation of a 3000 ton floating drydock at the United States Coast Guard Depot, Curtis Bay, Maryland, by the Commandant. This floating dock is to be of the longitudinally - trussed type, with steel wings and wood pontoons consisting of five sections, which, when connected by steel pins, form a rigid dock. By the removal of four pins, any section may be separated for drydocking on the remaining sections.

The general dimensions are to be as follows:

Length over keel blocks, 300 ft.; length overall, 350 ft.; width overall, 84 ft.; width between wings, 64 ft.; depth of water over keel blocks, 20 ft.

Pumping will be done by twenty pumps, direct connected to vertical electric motors, with the control centralized in a control house ashore. Separate water level indicators will be located in the control house, each adjacent to the control of the corresponding pump, so that the interior water levels may be maintained as desired, permitting one operator to control the entire operation.

This floating dock will be equipped with capstans, bollards, flood lights, loud speaker system and other appurtenances.

The consulting engineer for the design and supervision is J. Stuart Crandall of Crandall Dry Dock Engineers, Inc. The contractor is Tuller Construction Company, Red Bank, New Jersey. It is anticipated that this floating dock will be in operation early in 1942.

Expansion of Ship Material Firm

Because of greatly-increased demand for their products in the rapidly-expanding Bay region shipbuilding industry, E. H. Peterson, president of Malott & Peterson, whose firm played an active and important role in the last great war shipbuilding boom, announces an increase in the staff and additions to the products of the company for better serving of the shipbuilding firms in that region.

Established in 1912, the firm has three main departments:

The Flooring Department, which includes a complete line of resilient floor coverings, deck and awning coverings and industrial mastics, is headed by Richard Grundy, assisted by Al Morris, Bob McGovern and others.

The Roofing and Waterproofing Department is headed by Vice President Ray Miller, whose staff includes a group of three competent estimators.

The Tile Department, which includes a complete line of ceramics and glazed tile, is headed by Oscar Anderson, with several assistant estimators.

All of these department heads have had more than twenty years of practical experience in their various lines, and have under their jurisdiction a group of expert workment.

A mosquito torpedo boat at full speed

C-1 motorship Cape Alava at her builder's outfitting dock, Tacoma

Ventilation on Torpedo Boats

Two new members of the experimental "Mosquito Fleet" have been released to the U. S. Navy, according to the builders, Higgins Industries, Inc., of New Orleans.

The new Torpedo Boats, known as the PT5 and PT6, are 81 footers—part of a fleet of eight being constructed in New Orleans, Detroit, Miami, and Philadelphia under the $15,000,000.00 federal appropriation for torpedo boats and submarine chasers.

Each boat is equipped with two B/9 and two B/12 direct-connected Ilg blowers to provide fresh, vitalized air for the crew and to remove odors, cooking fumes, etc. The motors are mounted directly upon the blower wheels to avoid friction and noise, also to save the extra space and weight required by a coupled motor mounted on a separate pedestal.

Charleston To Build Navy Fleet Tugs

The Charleston Shipbuilding and Dry Dock Company of Charleston, South Carolina has been awarded a contract to build six 205 foot mine sweeping fleet tugs for the U. S. Navy.

This company has been reorganized and its officers and board are now as follows:

President, John B. Hollister; vice president and general manager, L. Louis Green, Jr.; secretary and treasurer, Elmer Hibbe; purchasing agent, W. F. Martin; naval architect, L. Louis Green, Jr.; superintendent, A. A. Gerken.

Directors: John B. Hollister, George A. Rentschler, L. Louis Green, Jr., Edward P. Farley, Preston Davie, Charles L. Mullally.

(Section continued on page 104)

Fire at Sea

Detect Promptly – Extinguish Instantly

by H. H. Dierksen
Walter Kidde & Co., Inc.

All America, whether ashore or afloat, is thinking more and more about fire and what to do about it.

A prominent fire protection engineer recently stated that the problem today is doubly difficult. Formerly, good practice in fire protection was based on planning against every conceivable *accidental* fire. Right now this is not enough. *You must be prepared to combat fires that have been carefully planned.* You have to get the jump on the saboteur, and be ready for him.

Generally speaking, there are two indisputable facts:

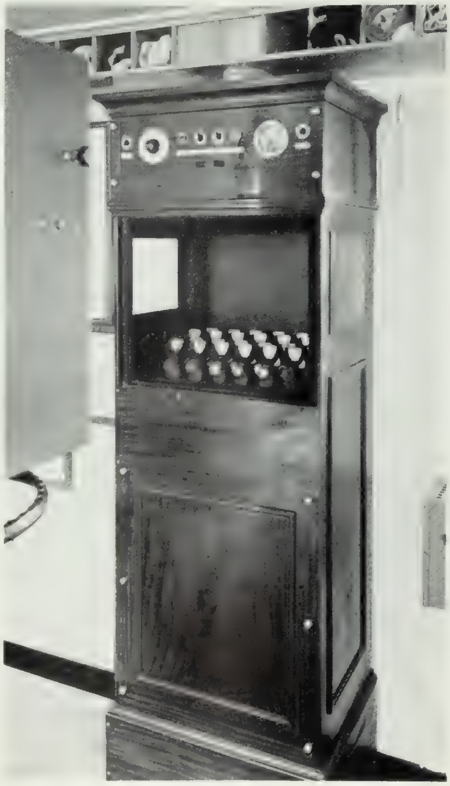
First, you must start by taking every ordinary precaution, by observing every rule of proper protection against fire.

Second, every big fire was once a little fire.

Stated differently, this second statement means that your best safeguard against a big fire is to control it while it is still small. This means prompt and accurate fire detection.

On shipboard these two facts are even more important than ashore.

There's an old saying, "Where there's smoke there's fire." That is the basis on which the Rich System of fire detection is engineered. Catch the first few wisps of smoke given off by a fire as it starts, and you have ample warning of the danger. It may sound like an exaggeration to speak of "wisps of smoke" as detectable by means of built-in equipment. There is, however, a case in our records of a seaman who was caught smoking a cigarette, due to the routine functioning of a smoke detecting cabinet. The indicator showed the presence of smoke . . . and the investigating party found only an embarrassed sailor and a cigarette. With that kind of efficiency it is certain that a real fire can't get by, undetected.



Smoke detection cabinet

In the main, on shipboard smoke detection is applied only to spaces which are unpatroled. These include cargo holds, bo'sun's storerooms, paint lockers, lamp lockers, and oil storerooms.

Air Sampling

Smoke is the first product of fire. It rises to the underside of the deck and creeps along the deck beams. The Rich System is a means of detecting this smoke, through the simple process of drawing off air samples from the unpatroled spaces on the ship. Individual pipe lines lead from each space and are conveyed to the detecting cabinet which is usually located in the wheelhouse.

Should smoke occur in any one of the air samples, it will become immediately visible by illumination. An arrangement of lights, lenses and mirrors will illuminate the smoke column as it comes up through the cabinet and will promptly attract the attention of the watch officer. As an added safety factor, all air samples are led from the cabinet out into the wheel-house. Thus an officer, who is momentarily engaged, can quickly become conscious of the acrid odor of smoke, even though he has missed the visual warning of its presence in the cabinet.

This is not a complicated installation, mechanically speaking. Moreover, its very simplicity leads to complete reliability. The exhaust fan system which draws the air samples through the pipes, involves no operating difficulties. There are no other moving parts.

Locating the Fire

When the presence of smoke in the detecting cabinet warns the watch officer that he has a fire on his hands, he can, by glancing at the cabinet, tell exactly where the smoke is coming from. Each pipe in the cabinet ends in a flare, and each flare is identified by a number. That number locates the fire. If, for example, smoke is coming from the flare number "12," the officer notes from a wall chart that "12" is Paint Locker No. 1. And that is where the trouble is brewing.

Next move is to get the fire out. For this purpose, ship operators are placing increased dependance on the fire-killing qualities of carbon dioxide gas. The use of this gas in extinguishing ship fires is not new, in fact, the very first commercial application of carbon dioxide for fire protection was in installations for cargo protection. This antedated, by many months, its em-

MARINE DEPARTMENT
AETNA INSURANCE CO.
QUEEN INSURANCE CO.
MARITIME INSURANCE CO., LTD.
FIDELITY PHENIX FIRE INS. CO.
Commercial Hull Dept.
AUTOMOBILE INS. CO.

MATHEWS & LIVINGSTON
Marine Underwriters
200 BUSH STREET · · · · SAN FRANCISCO
Offices at: Colman Bldg., Seattle · 111 West 7th St., Los Angeles

ployment to control fires in electrical machinery. It also preceded the development of the portable carbon dioxide extinguisher.

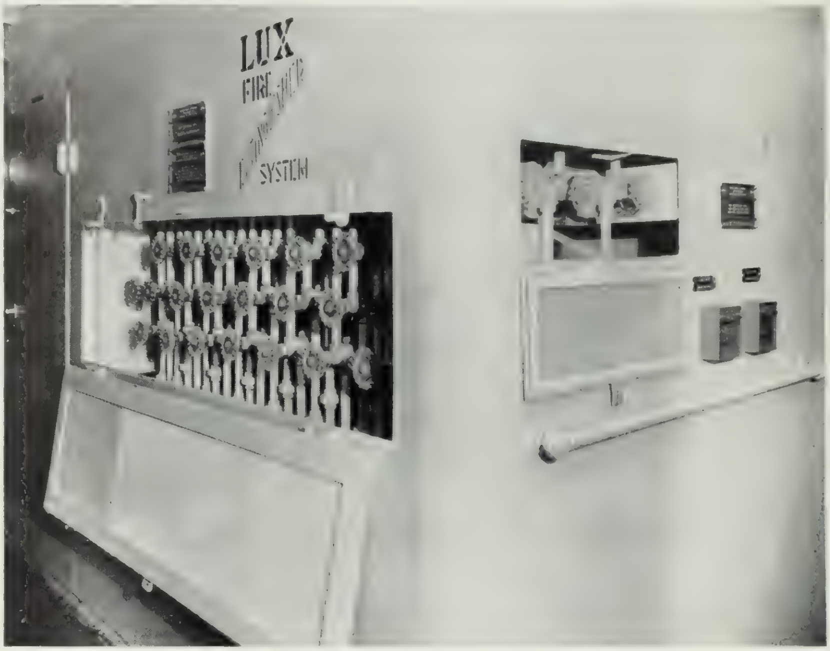
Fire Must Breathe

It is a well known fact that fire needs oxygen. The air around us contains 21% oxygen and this is enough to support combustion. However, if you cut this percentage down to 14 or 15%, you have an atmosphere in which most materials cannot burn.

Take a cargo hold in which a fire is burning. Dump in sufficient carbon dioxide to dilute the oxygen content of its air to the above mentioned 15%. And the fire is dead.

There is no need to go deeply into the engineering aspects of a carbon dioxide fire extinguishing system. Briefly, it consists of the storage cylinders which hold the gas, the piping which distributes it to the protected spaces, the nozzles which spread the gas throughout the fire area, and the controls which start the whole system in action.

Certain advantages in carbon dioxide fire extinguishing have definitely proved themselves. First, this gas is one of the fastest of all known extinguishing agents. Again, it is instantly available, since the distributing system is completely independent of outside sources of power, or equipment or supply. You see, no outside impulse is needed to carry the gas through the piping; the force of its own expansion takes care of that the instant that the controls are released. Further, the stored carbon dioxide is used for no other purpose on the ship except for fire fighting. It is there when you need it.



Control valves are located for easy access

A battery of Lux cylinders on the Queen Mary

The third advantage of carbon dioxide is its harmlessness.

The Combined System

We have discussed fire detection and fire extinguishing as two separate subjects. However, it is possible to combine both into a single protective system. This is known as the Lux-Rich installation and it utilizes the same piping for distribution of the carbon dioxide gas as is used for drawing the air from the protected spaces into the smoke detecting cabinet.

Imagine a great Y, made of piping. At its base is the cargo hold or protected space. At one upper branch of the Y is the smoke detecting cabinet; at the other branch, the carbon dioxide supply cylinders. Ordinarily the "carbon dioxide branch" of the Y is shut off, and the air is drawn from the hold up into the cabinet. When fire is detected, a valve is turned, which is located at the junction formed by the two arms of the Y and its base. This valve shuts off the piping running up the arm to the detecting cabinet and, instead, opens up the "carbon dioxide branch," simultaneously releasing from the cylinders the gas which drives into the hold where discharge nozzles pour the gas throughout the entire space.

Audible Alarm

A still further refinement in the smoke detecting system is possible. Instead of relying on the alertness of the bridge officer to notice presence of smoke in the detecting cabinet, an audible alarm system may be incorporated which gives instant, compelling warning the moment that smoke appears. This is known as the Richaudio device. It assures immediate attention to fire, since the sound of the alarm bell cannot be ignored.

PMR'S

last minute Graphic!

ARITIME CADETS
ORMACSUN TRIAL TRIP
ROPELLERS HEAR ADMIRAL WAESCHE

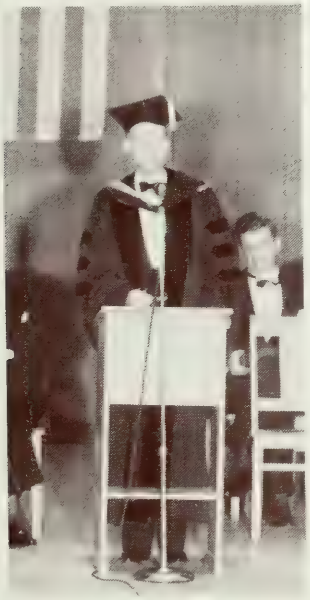
at San Francisco May 8th

It was an inspiring sight when all available members of the student body of the California Maritime Academy marched "heads erect" into the auditorium of the Marina Junior High School to do honor to thirty-eight cadets who comprised the graduating class of 1941.

On the platform were assembled officials of the United States Maritime Commission, the State and City, the Navy, the Coast Guard, the Pacific-American Steamship Association and The Propeller Club of the United States.

Impressive was the awarding of degrees to the Deck and Engineering graduates, many of whom have already been commissioned to posts aboard merchant ships and with the Maritime Commission. This scribe could not help but mark the contrast with previous years, when appointments of schoolship grads to 'board-ship duties were the concern of all who have interested themselves in the Academy's welfare.

Honorary Degree for Joseph A. Moore (left center)



A message to the graduates by Rear Admiral Russell R. Waesche, Commandant, U. S. Coast Guard

Said Rear Admiral Russell R. Waesche, Commandant, United States Coast Guard, who was chosen to deliver the Godspeed message to the young men:

"At this critical time, when patriotism, loyalty and discipline are cardinal attributes in the nation's defense, a greater degree of responsibility than ever before rests on licensed officers."

General chairman of the program was Captain Henry Blackstone, and an efficient helmsman he was, setting a "streamlined" course which all speakers followed.

Honorary Degrees of Doctor of Laws were bestowed on three men whose services to the Merchant Marine have been outstanding. First to be so honored was **Joseph A. Moore, Sr.,** chairman of the board of the Moore Dry Dock Company. **Robert H. Fouke,** in behalf of the State of California, and as governor of the California Maritime Academy, made the award with glowing tribute to Mr. Moore's superb record in building merchant ships . . . during two national emergencies.

The first cadet to answer the roll-call for Award of Degrees was James P. Anderson. Capt. Charles Mays, Academy Superintendent, officiated. In the first row starting left, Dr. J. A. Burkman, Vice-Chairman, Board of Governors; Arthur M. Tode; Robert H. Fouke; Joseph A. Moore, Sr.; Rear Admiral R. R. Waesche and Capt. Henry Blackstone

Arthur M. Tode, honorary president of The Propeller Club of the United States, was the second of the three to receive the distinctive honor—"By reason of his long and altruistic service in furthering the cause of the Merchant Marine . . . and as the founder and motivating force of the national Propeller organization, which, under his tireless vigilance, has developed bulwarks of strength in every maritime district," said Mr. Fouke.

Rear Admiral Waesche was similarly honored in recognition of his labors in coordinating the interrelationship of the Coast Guard and Merchant Marine.

Admiral Waesche's message to the cadets was based on the test of "St. Andrew, the Sailor," and he admonished the young men to hold aloft the torch of Andrew Furuseth as their inspiration.

Sponsoring organization of the 1941 graduation exercises was The Propeller Club of the United States — Port of San Francisco — with President Charles L. Wheeler delivering the address of welcome. The Port of San Francisco committee assisting Capt. Blackstone was P. N. Harding, Edward H. Harms, A. J. Owens, Capt. Lewis Mesherry and Byron O. Pickard.

Two magnificent prizes were presented by the Pacific-American Steamship Association, with Byron Pickard as their spokesman. **Cadet James M. Jensen** won the coveted honor in the Deck classification, and **Lester H. Erickson** was the honored Engineer.

The awarding of graduation degrees was conducted by **Claude B. Mayo, Captain, U. S. N. (retired),** who expressed his pride in the advancement of the Academy during the comparatively short tenure of his office as Superintendent.

Walter J. Walsh, president of the Army and Navy Club, bestowed medals for meritorious accomplishments in behalf of his organization.

We salute these members of the 1941 graduating class, and wish them many happy voyages:

Deck Cadets

James P. Anderson
Raymond P. Calou
Jack I. Carter
Richard T. Cavins
Raymond I. Clayton
John A. Cleborne
Robert E. Donaldson
Henry A. Flood
Zed A. Gwartney
Paul R. Haertel
James N. Jensen
Ernest N. Kettenhofen
Nathaniel F. Main
Kevin R. Morrison
Richard A. Murry
Ralph W. Newman
Robert W. Owens
Frank J. Peterson
G. Warren Prada
Ben Schoenleber
Kendall C. Shaffer
William C. Weldon

Engineering Cadets

John A. Cronin
Harry A. Doell
Rodney M. Elden
Lester H. Erickson
Leon Heller
Howard L. Kubel
Michael P. Locke
J. Grant O'Donnell
Robert L. Peck
Bernard T. Ross
William L. Russon
Osborne G. Rutherford
Joseph H. Schwab
Irving Singman
Erwin J. Wells
Roy M. Wimer

Arthur M. Tode, Honorary President, Propeller Club of the United States, recei degree from Robert H. Fouke

Mormacsun Trial Trip

at San Francisco May 6th

Fourth C-3 built by the Moore Dry Dock Company and last of a program of four sister ships, S. S. Mormacsun had her preliminary sea trial on May 6 and is at this writing again at sea on a prolonged standardization trial, during which she will undergo severe tests and probably establish some new records for her builders and for the U. S. Maritime Commission.

All four of these vessels have been uniformly successful in passing tests with flying colors. The first ship was taken over by the U. S. Navy and is now U. S. S. Tangier. The second, third and fourth ships were allocated to Moore-McCormack Lines, Inc., and christened respectively, Mormacstar, Mormacsea and Mormacsun.

These ships are the U. S. Maritime Commission standard C-3 cargo steamer, shelter deck type.

Their principal dimensions are given in table herewith:

Length O. A.	492′0″
Length B. P.	465′0″
Beam M.	69′6″
Depth M. S. D.	42′6″
Depth M. 2nd D.	33′6″
Draft loaded	28′7½″
Displacement	17600 tons
Gross measure	7680 tons
Net measure	4550 tons
Weight of vessel	5680 tons
Total dwt capacity	11920 tons
Cargo dwt capacity	9860 tons
Prop. power normal	8500 shp
Sus. sea speed	16½ knots
Cruise rad.	12000 miles
Normal crew	43
Passengers	12

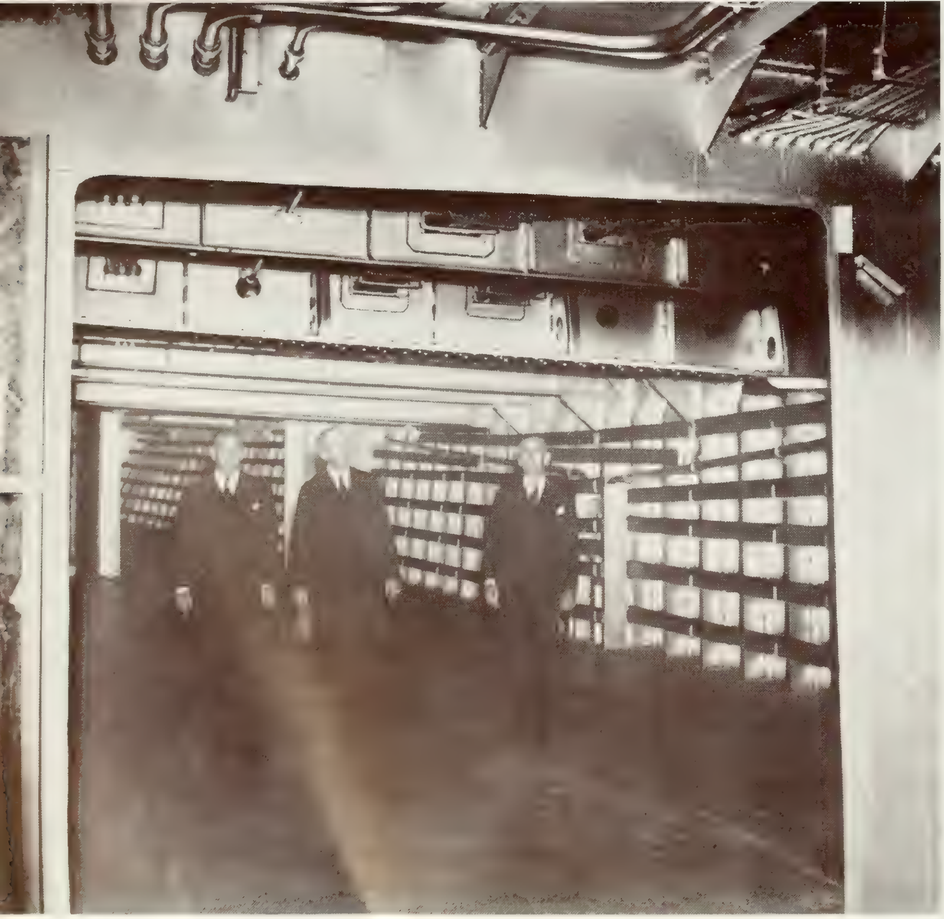
The hulls of these ships, as fabricated and erected at the Moore yard, are a magnificent piece of steel work. Note in the illustration of 'tween deck space how neat and shipshape is the workmanship displayed in both welded and riveted joints, and in pipe fittings. All the experts agree that Moore ships have no superiors on these vital points.

On her preliminary trials, the Mormacsun demonstrated as to speed of ship, economy of main propulsion plant and capacity and performance of auxiliaries.

Her two D type Foster Wheeler steam generators, served by Todd "Variable Capacity" oil burners operating under Mason-Neilan control, supply steam at 440 psi pressure and 740° F. temperature to a De Laval cross compound double reduction geared turbine which delivers 8500 shp at 85 rpm to a solid four-bladed bronze

From left to right:

Albert V. Moore, president Moore-McCormack Lines, Inc.; B. G. Furey, chief of operations, Moore-McCormack; Commander K. H. Donavin, assistant to the President. Joseph A. Moore, Sr., Chairman of the Board, The Moore Dry Dock Company



Moore-McCormack executives Albert V. Moore (left) and Commander K. H. Donavin (right) on inspection tour with Joseph A. Moore, builder of the Mormacsun

This view shows neat and shipshape workmanship displayed in both welded and riveted joints and in pipe fittings, in 'tween deck space . . . upholding Moore yard standards on these vital points

Note the light reflecting qualities of aluminum paint propeller having a diameter of 21 feet 7 inches and a pitch of 21 feet 6 inches at half radius.

This steam generator and turbine combination has more than enough capacity to deliver ten per cent overload or 9350 shp continuously and 25 per cent overload or 10,625 shp for two hours. On this maximum output, the hull can make from 19 to 20 knots in calm water.

The low pressure unit of the turbine exhausts directly into the Worthington condenser and the exhaust steam condensate coming away from the bottom of condenser at a temperature of 92° F. is forced by the condensate pumps through lower stages of heating to the big Worthington deaerating heater and hot well. This heater is located high up in the engine room casing and forms a positive suction hot well for the Worthington main feed pumps which take the feed at 240° F. and force it through a Davis Engineering heater raising it to 316° F. and so back to the steam generator.

All auxiliaries are electric drive and all lighting and most cooking is by electricity. Two 300 kw De Laval turbine-Crocker Wheeler generator sets are installed on the dynamo flat to carry this load. These sets work under same steam conditions as the main engines.

Most comfortable and modern accommodations are provided for a complement of 43 officers and crew and for twelve passengers, all in the midship deck erection.

As on all the trials held by the Moore Dry Dock Company, Joseph A. Moore was the genial host. On this occasion his guests included Albert V. Moore, president; Commander Donavin, Pacific Coast operating manager; B. G. Furey, chief of operations; H. R. Glennor, efficiency engineer; Captain C. M. Gregovitch; and Ralph Bybee, Pacific Coast freight traffic manager—all of Moore-McCormack Lines, Inc.—David Currier, chief Pacific Coast inspector of the Maritime Commission; a large group of experts representing the U. S. Maritime Commission; the various manufacturers who supplied the machinery and equipment; and J. S. Hines, publisher Pacific Marine Review.

Captain C. M. Gregovich who will command the efficient new C-3 cargo steamer

Ready to embark on trial run of Mormacsun are: David Currier, Chief Inspector, Pacific Coast, U. S. Maritime Commission; the next two gentlemen, Comm. Donavin and A. V. Moore, you have already met; on the right is Ralph Bybee, General Freight Manager of Moore-McCormack Lines, Inc.

A. V. Moore, Jos. A. Moore and Commander Donavin pose for P. M. R.'s candid camera in front of cargo battens, 'tween decks. The man behind the camera: Publisher Jim Hines

Rear Admiral Waesche Addresses San Francisco Propellers

On May 6, the Port of San Francisco membership and many distinguished guests taxed to capacity the club's official meeting quarters at the Palace Hotel, marking one of the liveliest Propeller meetings it has been our pleasure to attend.

Flying out from Washington, D. C., Rear Admiral Russell R. Waesche, Commandant, United States Coast Guard, was guest speaker, delivering an absorbing and particularly timely message to the maritimers who comprised his audience.

The program was a rapid-fire coverage of the San Francisco group's many current activities. **President Charles L. Wheeler** called for reports from **Eugene Hoffman, Edward Harms, Byron Pickard** and **Capt. Henry Blackstone.**

Secretary Hoffman piloted the course during introduction of guests. Among those who were welcomed aboard were **Jack Young of Young Brothers, Ltd.,** of the Honolulu club, who is now on the mainland for several days. Jack, guest of **Herman D. Nichols** of Tubbs Cordage Co., was royally greeted by his scores of friends.

George A. Armes, president of General Engineering & Dry Dock Company, presented his son Jack. Also greeted was Lieutenant Russell R. Waesche, Jr., who is following in his father's Coast Guard "wake."

From Oakland, introduced by Ed Harms, were George Bushnell, John A. Sowers and C. M. Waters, the triumvirate on whom the hopes for a Port of Oakland club are resting.

Skipper Blackstone got a hand for **Carl Cleverdon,** secretary of the California Maritime Academy.

New members present were Stanley Davis of the Accident Prevention Bureau and Donald Watson of the Pacific Coast Direct Lines.

With Bob Fouke was Harold Squires, industrial manager of San Francisco's Chamber of Commerce.

Arthur Poole of A. P. L. presented newly appointed Assistant to the President of his company, Russell E. Lutz.

Bob Spear of Foster Wheeler had two guests aboard . . . one of them Jack Kennedy of Plant Rubber and Asbestos, the other a prospective member, Glenn C. Barnaby.

General Convention Chairman Harms gave the official report of the Los Angeles - San Francisco get - together at Del Monte, an account of which appears in adjoining pages of this issue of P. M. R. Somehow, Eddie's recital made it sound tremendously more exciting than this scribe's retrospective accounting. Eddie also brought the membership up to date on the big job which he and his committeemen are performing for the October convention, Harms stating that all hands are already working at full steam.

Capt. Blackstone told about the graduation exercise of the California Maritime Academy, held the previous evening, proving to be a factual reporter par excellence.

President Wheeler, in introducing the honored speaker commented on the timeliness of a discourse which analyzes the employer-employee problem. "Our guest, Admiral Waesche, has devoted abundant time and thought to this highly pertinent subject and it is most gratifying to witness the interest of shipping men in his message as attested by this splendid turnout today."

Said Admiral Waesche:

"The destinies of the Coast Guard are bound up in the work that the Propeller Club is accomplishing.

"In no small part, your organization through its concerted efforts is responsible for the awakening of America to the need of a merchant marine.

"This job is now accomplished. During this marking-time period, it would be well for the Propeller Clubs of the nation to devote their time, their study to the post-war period. In my opinion this study may very well be the key to our mercantile future.

"In your job of promoting harmony between the owners and labor strive to establish the Propeller Club as a neutral in the minds of the employed. You have made great progress in this direction since the days when labor branded the Propeller organization as employer-controlled. So I admonish—aim to be the neutral if you would help solve the problem."

Admiral Waesche traced the history of the Coast Guard in its interdependability with the merchant marine, outlining the remarkable thoroughness of the training which the men in the service are now receiving. Pertinently interesting to his listeners were the speaker's remarks concerning plans for strengthening the present manpower. The present enrollment of twenty-one thousand is to be increased by sixteen thousand additional personnel.

"Our licensed officers are endoctrinated with the constant realization of the close association of the Service with the merchant marine. There are innumerable instances where Coast Guardsmen have risked, have sacrificed their lives in their job of protecting the life and property of merchant shipping," stated the speaker.

It is safe to say that Admiral Waesche left every man in his audience with a keener appreciation of the good work which is quietly being accomplished by the Coast Guard in the daily routine of its duties—in the interests of American shipping. All of us are deeply indebted for his stirring message.

As a climax to the meeting, President Wheeler presented Honorary President of the Propeller Club of the United States, Arthur M. Tode. President Tode, a forceful and dynamic speaker, told of the tremendous strides still being made in broadening the influence of the organization into new maritime districts. "Just a few short months ago it was my great pleasure to present a charter to this San Francisco group as Port 65. Today, we have 79 Ports, all working together for the one common aim.

"Remember, gentlemen, there is no other marine organization in existence which is spreading information, laboring for the advancement of our industry.

"Propeller Ports on the shores of rivers, gulfs or lakes all have the same stake in this organization—the same stake as you here on the Pacific seaboard!"

Mr. Tode, in commenting on the national convention which comes to the City by the Golden Gate in October, made the challenging statement that the 1941 American Merchant Marine Conference will be the most important yet held.

Running LIGHTS

Names in the MARINE SPOTLIGHT of the month

What Your Friends Are Doing

On May 1, H. H. MacDonough & Co. and J. E. Parkinson became consolidated under the name of MacDonough-Parkinson Co., customhouse brokerage firm, with offices in the H. W. Hellman Building, 354 South Spring Street, Los Angeles, California.

◆

Brae Loveless became associated with the California Shipbuilding Corporation, Terminal Island, in April after six years as westbound freight agent for the American - Hawaiian Steamship Co. in Los Angeles.

◆

H. R. Dorr, resident manager of the Los Angeles office of Norton Lilly & Company, announced that his firm has moved three flights up from suite 711 to 1009 in the Van Nuys Building. Norton Lilly & Company are agents for the Yamashito Line, The Isthmian Steamship Line and the American Manchurian Line.

◆

E. A. Reid was appointed traffic manager of the Oakland Chamber of Commerce the latter part of April and will handle all traffic matters brought to the attention of the chamber.

He replaces E. S. Wilcox, who has resumed legal practice. Mr. Reid was previously associated with the Pacific Coastwise Conference and was general freight agent for Gulf-Pacific Lines.

◆

Atkins, Kroll & Co., importers, moved in April from 260 to 230 California Street, San Francisco, California, where they will have larger quarters.

MARITIME DAY—MAY 22

A Proclamation

Whereas, in Public Resolution 7, approved May, 1933, it is stated that on May 22, 1819, the steamship The Savannah departed from Savannah, Ga., on the first successful transoceanic voyage under steam propulsion, thus making a material contribution to the advancement of ocean transportation; and,

Whereas, by said resolution the president of the United States is authorized and requested annually to issue a proclamation calling upon the people of the United States to observe May 22 of each year as National Maritime Day;

Now, therefore, I, Franklin D. Roosevelt, President of the United States of America, by virtue of the authority vested in me, do hereby issue my proclamation calling upon the people of the United States to observe May 22, 1933 as National Maritime Day by displaying the flag at their homes or other suitable places, and I hereby direct that government officials display the flag on all government buildings that day.

FRANKLIN D. ROOSEVELT.

R. J. Doremer, manager of the Kingsley Company of California at San Francisco, announced the appointment of E. C. Small as the representative of the company in Southern California. As the McCormick Steamship Company in Los Angeles is the agent in that district, Mr. Small will be located in their offices.

◆

C. O. Burgin, traffic manager of the Port of Stockton, made two news stories during April. The first was regarding the certificate given him entitling him to direct the presentation of testimony before the Interstate Commerce Commission. The other had to do with his hobby of oil and water paintings. A collection of his works was on display in the window devoted to art in the Shell Oil Company building in San Francisco.

◆

Dr. Henry F. Grady, president of the American President Lines, accepted the invitation from Governor Olson of California on April 28 to serve as a member of the California Employment Commission.

Dr. Grady was in Washington, D. C., at the time on business for his company with plans to proceed to Newport News for the launching of the new liner President Van Buren on May 1.

◆

The Waterman Steamship Corporation of Mobile, Alabama, announced March 25 the election of **Roy T. Lemon** as a vice president and chief engineer.

Marine Men and Women

The Women's Traffic Club of Los Angeles, the oldest club of its kind in the world, celebrated their sixteenth birthday with a party on April 23. Besides being the first women's traffic club to organize, it has several other "firsts." It was the first women's club to become a member of the Associated Traffic Clubs of America, in which it was the first to place a feminine member on the board of directors.

It took a bus to bring two persons of the shipping fraternity together. Edith Peterson, daughter of an official of Swayne & Hoyt Steamship Company, and Glendon Woodcock, assistant general booking agent in the Matson Lines San Francisco office, were waiting on April 18 for a Mill Valley bus that was behind schedule. With a few mutual comments concerning the delay, the romance began.

Nine days later, the two were again discussing schedules, this time at Reno where marriage climaxed a rapid-fire courtship.

New Ship Officers

The two Matson freighters Hawaiian Merchant and Hawaiian Planter have been assigned deck and engineer officers for their maiden voyages, May 10 and May 20, respectively.

Hawaiian Merchant assignments are: Capt. C. H. Morgan; W. H. Aguilar, chief officer; J. A. Zinn, second officer; W. S. Dodge, third officer; K. S. Castle, fourth officer; W. G. Dower, chief engineer; Henry Bettig, first assistant; Clyde A. Rose, second assistant; and David W. Billings, third assistant.

Hawaiian Planter assignments are: **Oliver Bergmann,** captain; **W. C. Canty,** chief officer; **Harold Rose,** second officer; **Harold Davis,** third officer; **H. S. Diefendorf,** fourth officer; **H. T. Berger,** chief engineer; **H. L. Engstrom,** second engineer; **Milton Gildersleeve,** third assistant; and **Irving Simpson,** fourth assistant.

The coveted American Petroleum Institute Certificate for lowest industrial injury frequency rate was awarded the Marine Department of Standard Oil Company of California. The record was for 1939 and applied to all operators of large tanker fleets which report to the A. P. I. Halftone shows Standard of California Director J. L. Hanna (right) presenting the award to Joseph H. McEachern, Manager Marine Department

Safety Record

Credit goes to the teamwork aboard Standard Oil Company of California's big fleet of tankers for the Accident-Prevention award for 1939 presented to the Marine Department by the American Petroleum Institute. Standard had the lowest Industrial Injury Frequency Rate last year of any of the seven reporting operators of large tanker fleets. In addition, it has the second best Severity Rate and the best Injury Index Rate.

The first two of these methods of measuring work-safety were established by the National Safety Council, and the third—a combination of them—by the Company's Safety Department. The Frequency Rate is based on the number of injuries per million man-hours of work. The Severity Rate takes into account the number of days lost per thousand man-hours of work. The Injury Index brings the two together on a safety chart in a single convenient curve.

What kept Standard seamen a little safer during work hours last year?

On each tanker there is an accident-prevention committee — the "Ship's Safety Committee"—composed of the captain and all officers. Once a month without fail this committee meets and inspects the ship, then discusses its findings and any suggestions that have come from the crew. In its report of each meeting to the Marine Department at San Francisco it gives its conclusions in detail.

The Shore Committee, which includes the marine superintendent, the safety engineer and heads of the various divisions in the department, reviews any accident reports that have come in and also considers the minutes of the safety meetings aboard all ships. Anyone from any ship can meet with this shore committee—the men are asked to, in fact, to make suggestions that will help their work along.

Once a month a practical safety bulletin is published.

Safety-consciousness, from galley to bridge, has made the whole program "click"—and win awards.

Harbor Day!

San Francisco's twelfth annual Harbor Day celebration, sponsored by the San Francisco Junior Chamber of Commerce, will be held on Saturday, August 2, it has been announced.

The colorful maritime program features yachting, power cruiser and rowing races, and a gala marine parade of yachts, cruisers, fishing boats and industrial craft. Spectacular demonstrations by the California Maritime Academy and the U. S. Coast Guard will be included in the program.

The celebration this year assumes greater significance in view of the increasing importance of maritime activity in connection with national defense preparations, the Junior Chamber states.

The full schedule of aquatic events will be staged along the Marina within sight of the Golden Gate and San Francisco Bay bridges, it was concluded.

MARINERS CLUB of CALIFORNIA

A. T. HUNTER, *President*

ERIK KRAG, *Vise-President*

STANLEY E. ALLEN, *Secretary-Treasurer*

Board of Governors

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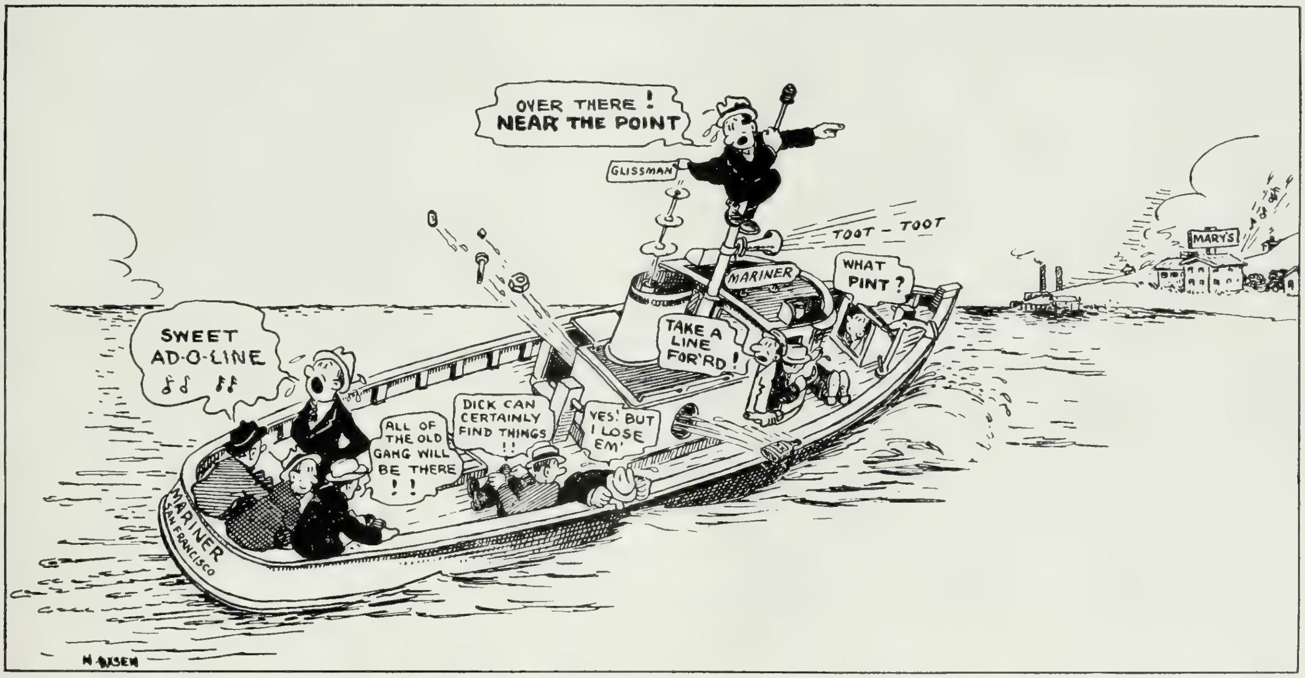
FRED MC LEAN
DAVID MILLAR
THOMAS G. MUNRO
F. P. RITCHIE
THOMAS A. SHORT

Announces its

12th ANNUAL SPRING FROLIC



Friday Night, May 23, 1941

AT

MARY'S VENETIAN VILLA

840 DONAHUE STREET — HUNTERS POINT

The greatest party the Club has ever attempted. Come out to the Point and enjoy a marine view that will thrill you — with Food the best ever — A sparkling show — Good fellowship — Strictly informal — $3.00 per plate — 7:00 p. m.

THE DEAD WEIGHT CAPACITY IS 250 PERSONS THEREFOR WHEN THE GOOD SHIP "MARINER" IS DOWN TO HER PLIMSOL MARK NO FURTHER RESERVATIONS WILL BE ACCEPTED — THE CARGO BOOMS WILL BE STOWED — HELP THE COMMITTEE BY SENDING IN YOUR RESERVATIONS NOW — Phone DOuglas 2714 For Your Tickets.

ENTERTAINMENT COMMITTEE

Dick Glissman, Chairman, Ed. Binder, Ed. Gunderson, Edwin MacFarlane, Al. Mattingly, Al. O'Leary, Howard Oxen, Harold Weule

News of the Propeller Clubs of the United States

The Port of San Francisco

Charles L. Wheeler
President
John E. Cushing
First Vice-President
Arthur B. Poole
Second Vice-President
Hugh Gallagher
Third Vice-President
Eugene F. Hoffman
Secretary-Treasurer

BOARD OF GOVERNORS

Frazer A. Bailey
Capt. Henry Blackstone
John E. Cushing
Fred L. Doelker
Hugh Gallagher
A. S. Gunn
Edward H. Harms
George Jordan
Roger D. Lapham
Marshall Levis
Ira S. Lillick
Capt. Lewis Mesherry
Joseph A. Moore
Arthur B. Poole
Charles L. Wheeler

Del Monte Session Big Success!

The men who conceived the idea of the joint meeting of Los Angeles and San Francisco Propeller Clubs at Del Monte had a real inspiration! A delightful get-together goes down in the records as a tremendous success, and every member of the crew will take his "affy davy" on that!

The confluence began on Friday, April 18th, and the program of business and pastiming carried on until Sunday.

In attendance were a total of 30 members, eleven from Los Angeles and nineteen from San Francisco. **Edward H. Harms,** General Chairman of the 1941 Convention, presided.

From the Los Angeles Club were: President Ralph J. Chandler, First Vice-President Edgar M. Wilson, Secretary David Livingstone and Messrs. George W. Moore, J. D. Baker, Leonard Backus, Norman E. Dunnavant, Carl Fennema, Charles Bayly, A. M. Rosenfeld and Roy H. Beaton.

San Francisco's delegation included, in addition to Chairman Harms: John Davidson, Alternate for Governors Roger Lapham and John Cushing; D. N. Lillevand, Alternate for Governor Fred L. Doelker; Miles York, Alternate for Governor George Jordan; John Greany, Alternate for Governor A. S. Gunn, and Secretary-Treasurer Eugene F. Hoffman, also serving as Alternate for Governor Arthur B. Poole. Sam Hawkins, W. B. Hill, J. S. Hines, C. M. LeCount, Joseph Marias, W. E. Martin, J. P. McArthur, J. F. McConkey, B. O. Pickard (S. F. House Chairman), Carroll Reeves, Robert Spear, George Swett and Clyde Williamson also came aboard.

President Charles L. Wheeler broke an important engagement in San Francisco in order to be present at Del Monte for the joint club banquet Friday night.

Chairman Harms opened the meeting by explaining the primary purpose of the Del Monte gathering, namely, to give the two clubs an opportunity to become better acquainted and to work out a plan of inter-club cooperation for the 1941 Convention of Propeller Clubs and the American Merchant Marine Conference, scheduled for San Francisco October 21-24.

THE ATTENDANCE RECORD

1st Annual San Francisco-
Los Angeles "Get-Together"
Propeller Club of U. S.
Del Monté, California
April 18-20, inclusive, 1941

From Los Angeles: Total 21

Mr. and Mrs. L. Backus
Mr. and Mrs. J. D. Baker
Mr. and Mrs. Chas. A. Bayly
Mr. and Mrs. Roy Beaton
Mr. R. J. Chandler
Mr. N. E. Dunnevant
Mr. C. F. Fennema
Mr. David Livingstone
Mr. and Mrs. George Moore
Mr. Thomas E. Rhodes
Mr. A. B. Rosenfeld
Mr. and Mrs. L. K. Vernille
Mr. Howard Wickersham
Mr. and Mrs. Edgar M. Wilson

From San Francisco: Total 38

Mr. John Davidson
Mr. Bob Fouke
Mr. and Mrs. John T. Greany
Miss Greany
Mr. and Mrs. E. H. Harms
Mr. and Mrs. Sam Hawkins
Mr. and Mrs. W. B. Hill
Mr. and Mrs. James S. Hines
Mr. E. Hoffman
Mr. C. M. Le Count
Mr. and Mrs. D. N. Lillevand
Mr. Joseph Marias
Mr. and Mrs. W. E. Martin
Mr. John P. McArthur
Mr. and Mrs. J. F. McConkey
Mr. and Mrs. M. S. Pennington
Mr. B. O. Pickard
Mr. and Mrs. Carroll Reeves
Mr. and Mrs. Robert D. Spear
Mr. and Mrs. George E. Swett
Mr. and Mrs. Charles L. Wheeler
Mr. and Mrs. Clyde Williamson
Mr. and Mrs. M. F. York

Grand Total 59

The Chairman called on members of the Los Angeles delegation for Convention suggestions.

Ralph Chandler and Carl Fennema responded with presentations of ideas of cooperation which the Los Angeles group has to offer.

Chairman Harms then asked President Chandler if we would appoint a committee from the L. A. Club to work with a similar committee from the S. F. Club, the combined group to be known as a Coordinating Committee for the Convention, to which President Chandler agreed.

Chairman Harms next called for open discussion of Assembly Bill No. 1078 which has to do with a State appropriation for the Maritime Academy (School Ship). Harms explained that a committee representing the Pacific-American Steamship Association, the Propeller Club of San Francisco, the Mariners Club, the S. F. Chamber of Commerce and the American Legion had been set up to study the proposition.

Mr. Wilson told of tentative plans the Los Angeles Club has for working out a textbook on merchant shipping for use in public schools.

San Francisco member Clyde Williamson moved that the Northern Club thank the Los Angeles members for attending the Del Monte meeting and for contributing so much intelligent discussion on the School Ship, and on other matters of common Club interest.

President Chandler offered a companion resolution thanking the San Francisco Club for its excellent job as host, and expressed the hope that next year both groups could get together in a similar meeting at the Biltmore Hotel in Santa Barbara.

San Francisco House Chairman Byron Pickard tells us that a total of 58 persons attended the President's Dinner Friday night; that 20 members were registered from San Francisco, and 13 registered from Los Angeles; that the total delegation from San Francisco, including wives and guests, was 37, with 21 attending from Los Angeles.

Out of the three-day event comes the thought that such a gathering should be made an annual affair. We second the motion!

The Board of Governors of the
California Maritime Academy
requests the honor of your presence
at the
Graduation Exercises
of the Class of Nineteen Forty-One
sponsored by
The Propeller Club of the United States
Port of San Francisco
and the
Pacific American Steamship Association
to be held in the
Auditorium of the
Marina Junior High School
Bay and Fillmore Streets
Monday Evening, May Fifth
Nineteen Hundred and Forty-One
at seven thirty o'clock

On to San Francisco

On behalf of the Board of Governors of the Propeller Club of San Francisco, President Charles L. Wheeler has announced the list of committee chairmen who will work out plans for the big national convention of Propeller Clubs and the Merchant Marine Conference which will bring hundreds of the leading men in shipping and shipbuilding to San Francisco this fall . . . October 21-24. The list follows:

General Chairman, Edward H. Harms, McCormick Steamship Co.

General Vice-Chairman, Gene Hoffman, American President Lines.

Reception, Joseph F. Marias, Bd. State Harbor Commissioners.

Registration, K. C. Tripp, Moore-McCormack Lines.

Hotel and Banquet, Capt. Lewis Mesherry, Army & Navy Club.

Entertainment, Robert D. Spear, Foster Wheeler Corp.

Golf, Joseph A. Lunny, McCormick Steamship Co.

Publicity, Bern DeRochie, Pacific Marine Review.

Exhibits, William Radner, Matson Line.

Finance, Arthur B. Poole, American President Lines.

Printing, W. Edgar Martin, Westinghouse Electric Co.

Transportation, Co-Chairmen, John Davidson, American-Hawaiian, and Robert Fouke, Admiralty Attorney.

It has been announced from national headquarters in New York that President Wheeler of the local Propeller Club has been named vice-chairman of the Merchant Marine Conference, to serve with Lewis Luckenbach, chairman.

The first meeting of the local committee chairmen was held at the Army & Navy Club on April 15th, at a dinner meeting over which Chairman Harms presided.

●

At Del Monte. Starting left: Chas. A. Bayly, Mrs. J. D. Baker, Mr. Baker from Port of Los Angeles; the next gentleman is C. F. Fennema. Secretary David Livingstone and Roy Beaton of Los Angeles are also seen. That's C. M. "Dad" Le Count of General Electric Company, San Francisco modestly facing away

●

P. M. R. Goes to the Propeller Get-together

at Del Monte . . with Notebook and Camera

FACING PAGE

Upper left:

W. Edgar Martin of Westinghouse is facing camera. To "Eddie's" right is Mrs. Martin, then Norman Dunnavant of Los Angeles, Mrs. W. B. Hill, Walter B. Hill of Babcock & Wilcox, San Francisco. The lady who is hailing a friend is Mrs. Rosenblatt, wife of Westinghouse's G. B. Rosenblatt. The gentleman with his back to the camera is D. N. Lillevand of the Grace Line, San Francisco. At the table in the background, glimpses of Robert Spear of Foster Wheeler Corp., J. F. "Mac" McConkey, Sperry Gyroscope Co.; Bryon O. Pickard; Mrs. James S. Hines, wife of P. M. R.'s publisher Jimmy

Upper right:

In the foreground (profile) is John Davidson of American-Hawaiian. The gentleman facing you is George Swett of George E. Swett & Company. To George's right is Mrs. J. F. McConkey, wife of the Sperry Gyroscope Coast manager; next to the right is Mrs. George E. Swett

The two center views show some of those at the Speaker's Table. From left to right: George W. Moore and first vice president Edgar M. Wilson of the Port of Los Angeles; Eugene Hoffman, secretary-treasurer of the Port of San Francisco; A. B. Rosenfeld of Los Angeles; Mrs. George W. Moore; Ralph Chandler, president, Port of Los Angeles; Mrs. E. H. Harms, wife of the toastmaster; Joseph Marias, key-speaker for the San Francisco delegates

Lower left:

A bit of Del Monte's sunshine for these "tired business men": Edward H. Harms, Clyde Williamson, Byron O. Pickard and Carroll Reeves

Lower right:

Bethlehem's John T. Greany, across the table facing you, with Mrs. Greany and their charming daughter, at John's right

THE SPEAKERS

Chairman Harms (seated left) has just introduced President Charles L. Wheeler of San Francisco Port (standing). The lady between them is Mrs. E. M. Wilson. To the speaker's left is George Moore, then Mr. Wilson and San Francisco's secretary Eugene Hoffman

Center view: Ralph Chandler, the speaker.

Left to right: David Livingstone, G. B. Rosenblatt, Mrs. George Moore, Mr. Chandler, Mrs. E. H. Harms, Joseph Marias and Mrs. Charles L. Wheeler

Lower view: Speaker Marias whose key address is abstracted on an adjoining page.

More About the Del Monte Meet

Speaking on the subject "Foreign Trade Emergency After the War," J. F. Marius, president Board of State Harbor Commissioners, San Francisco, made a notable address of which the following is an abstract:

Our foreign trade is governed by two factors: One, our necessities which we cannot produce, and two, our surpluses which we exchange for these necessities. The question now arises: What preparedness are we making to secure the sources from which must be supplied these essentials, without which we cannot protect ourselves against military aggression—and also continue our American standard of living which must be maintained or improved to secure economic tranquility at home. These two points make one question. They must be considered as a unit.

We made changes after the last War. We shall make changes after this War. We have made changes since it started and, by the way, these changes have not been particularly satisfactory. We have been able thus far to get raw materials but we have not been able to pay for them entirely by our surpluses and that's something to think about.

We have about fifteen million bales of surplus cotton. We don't know what to do with it. We have an annual crop of something around twelve million bales, so the Government will soon add more to its fifteen million bale surplus. We have a similar staggering figure of wheat surpluses and also other commodities to a lesser degree. We would like to trade these items for necessities but they have at present no trading value. And still, we know of millions of people who need cotton and wheat.

Well, actually, China has a number of items we need but who is going to control China *after the War?* If Japan does the controlling, will not China raise cotton to be manufactured into textiles to be sold back to the Chinese and to other present customers of ours? Remember, Japan has been our best customer of cotton. Japan imported some of the finest English made machinery for textile manufacture and they make excellent materials.

Today China produces over four million bales of cotton, and it is Japan's intention to double that production.

Since the world now produces more than it consumes, if China adds four million bales to the total world production it can mean just this: We shall increase our unexportable surpluses and Japan will increase her exports of textiles.

Well, that, in my opinion, is just one of the drastic economic changes that will work adversely for us. What are we going to do about it?

The next point to discuss is the South American situation. Are we prepared to engage on a competitive basis against Germany's barter system? Will we accept a dollar's worth of Argentine beef for a dollar's worth of American manufacture? We will not. But Germany will. Germany will do more. Germany will accept one dollar's worth of Argentine beef for two dollar's worth of German manufacture. Germany will need to accomplish two economic developments: (1) Employ its people in manufacturing, and (2) feed these people.

Brazil offers a different picture but nevertheless it has its complications. Brazil's surpluses, in coffee and cotton particularly, are more than we can absorb. The cotton picture once more is related to the Japanese. I have heard that there are approximately 300,000 Japanese in and around Sao Paula—mostly raising cotton. Japan buys this cotton. Japan makes cheap imitations of almost everything under the sun. She can exchange Japanese raised Brazilian cotton for Japanese made radios, toys, cameras, etc., in competition with our radios, toys and cameras, for which we accept Brazilian raised Brazilian coffee.

When we think in terms of foreign trade after the War, we must be prepared to reckon with this economic penetration which the War has not stopped.

No people on earth are better salesmen than the Americans. We not only sell goods but we sell ideas. Any world traveler will tell you where he has seen the American sales influence in foreign countries. We sold the moving picture idea to the world. We also sold the typewriter idea and the radio. We put the benefits of these things and many others within the pocketbook reach of millions of people.

Now, what I am getting at is this—is it not reasonable to work in such harmony with our South American cousins that we shall use our American selling talents to dispose of their surpluses? If we cannot consume more coffee, then perhaps we can sell it to those who up to now have never used it. Coffee is an acquired taste. As one travels around the world, he finds many different forms of drinking coffee and as many different coffee berries used. It is not too hard to visualize many more millions of people acquiring the taste. If that is a fair presumption, we Americans of the United States must be the salesmen to sell the idea that it should be Latin-American coffee and then sell the coffee—and the coffee pots.

So much for brief illustrations. Now then, for a little prognostication. What will we, the United States, do immediately after the Wars are ended? We do not know just how the world will be divided but there have been enough boundary lines destroyed already to give a fair idea. Wherever War has actually scored the earth, destroyed the crops, killed the people, there will be reconstruction, rehabilitation. How shall it be accomplished? What part will the United States play? How shall we be paid?

Is it not reasonable to set ourselves up into some kind of an organization, with Federal assistance, if necessary, to concentrate on a plan of reconstruction? Probably every one of our shipping routes will have to be changed. Certainly our international credit structure will have to be reworked. Tariff and permit barriers will have to be changed. We will need properly educated, intelligent young men in every nook and corner of the world and now is the time to get busy.

In conclusion, I want to repeat that while the general staffs move armies and navies, and deadly combat rages behind the scenes, European economists are busy changing the courses they plan to follow in the never-ending peacetime struggle for the world's markets. This is especially true of the dictatorships and their thoroughness is known to all. They are already set to grab the Latin-American markets with agents already posted from the Mexican border to the Straits of Magellan. They will come out from under cover and swing into 100 per cent action once the war is ended. What is America doing to meet this European trade strategy? Now is the time for us to prepare to meet this competition with a thorough plan of action.

Port of Tacoma

The regular monthly meeting of the Propeller Club, Port of Tacoma, was held Tuesday night, April 15th, at the Tacoma Club, with the cocktail hour starting at 6:30 and the dinner at 7:15 p. m.

The largest turn-out in the history of the Tacoma Propeller Club was at this meeting, there being fifty-six members in attendance. The affair was by far the most interesting ever held and all members and guests were especially enthusiastic, both in regard to the social spirit which now prevails among the members, and the interesting and instructive programs.

President Ackerman, as usual, called the meeting to order immediately after a very fine dinner. As the program was too long, no business was brought up for discussion. Mr. Ackerman first called on all new members to rise and be introduced to the Club. The following are new members who have joined our Club since our last month's meeting, some of whom were not in attendance at this meeting:

Baxter F. Ball, General Petroleum Corp. of Calif.

Frank G. Ploof, Central Travel Bureau.

W. A. Springer, Weyerhaeuser Steamship Co.

M. H. Franklin, N. Y. K. Line.

H. E. Ellis, American Hawaiian Steamship Co.

Bernard Jager, American Hawaiian Steamship Co.

E. J. Clement, Luckenbach Steamship Co.

Lynn W. Jenkins, American Mail Line.

Herman E. Olsen, Foss Launch & Tug Co.

R. F. Martin, Defiance Lumber Co.

Carl N. Klitgaard, Standard Oil Co.

George Dorfner, McCormick Steamship Co.

John B. Schack, Seattle - Tacoma Shipbuilding Corp.

Thos. J. Firth of the U. S. Coast Guard, who has been a member of the Tacoma Propeller Club, has been dropped from the list as he has moved from the city.

After the introduction of new members, guests from Seattle were introduced. Keith Middleton, Jr., Vice-President of the Seattle Propeller Club and Mr. Tingling, Manager of Dodwell & Company, were the Seattle visitors. Mr. Tingling presented Capt. F. C. T. Harris of the British Mercantile Marine, who was the honor guest of the evening and who gave a particularly interesting and timely talk relative to his experiences on British boats since the start of the second World War. Capt. Harris spoke especially regarding his experience on being on a British merchantman as captain and having it be the first boat sent to the bottom of the Atlantic by a German pocket battleship, off the coast of Brazil. The captain stated that he had been sent over to the United States by Great Britain and had been here since January.

After the captain's address, colored films were shown by Henry Foss of the Foss Launch & Tug Co. These pictures showed the construction and collapse of the Tacoma Narrows bridge.

The meeting was adjourned by Pres. Ackerman immediately following the bridge film and everyone departed with the remark that it had been the finest meeting since the beginning of our club.

CHAS. C. CRAMP,
Secretary.

Bilge Club Notes

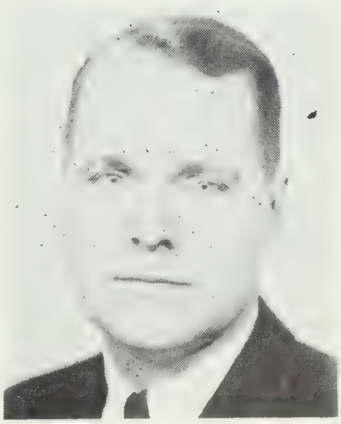
Lloyd Moore, president of The Bilge Club, is piping all hands aboard for the annual election and business meeting of the organization to be held on the evening of May 6th at the California Yacht Club in Long Beach.

Lieut. Comdr. William A. Mason was ready to navigate the 38-foot yawl Eventide in the 273-mile race from Los Angeles to Guadalupe, held early in April, when he received orders to report to Washington, D. C., for active naval duties.

His return to the Navy will mean he will be missed by the membership of the Barnacle Club of Long Beach and The Bilge Club of Wilmington. Before retirement four years ago, he was navigator of the destroyer tender Melville. Despite his four years away from active duty, he passed his physical examination in top form.

Commander Mason has been PACIFIC MARINE REVIEW's star reporter of Bilge Club activities since the charter days of the Los Angeles Harbor Club.

PLAN NOW!
COME TO
SAN FRANCISCO
IN OCTOBER
The Golden Gate will swing open to welcome
PROPELLER CLUBS
of the World



E. A. Preslar, turbine erecting engineer from Allis Chalmers, Milwaukee, who is at San Francisco supervising installation of turbo-generating sets on C-1s building at Bethlehem yard

Names in the MARINE SPOTLIGHT of the month

The Maritime Commission has drafted **Arch E. King,** vice president of the Isthmian Steamship Company, for the new Maritime Commission Bureau of Emergency Shipping, which supervises the policies of the commission regarding defense cargo preferences, charter and ocean freight rate stabilization and tonnage coordination. Mr. King will be on leave of absence from his regular work.

Carleton B. Tibbetts, vice president of Los Angeles Steel Casting Company, leader in defense activities in Southern California

* * *

Albert V. Moore, president of Moore-McCormack Lines, arrived in Los Angeles on April 28th, where he was met by K. H. Donavin, Pacific Coast manager of the Pacific Republics Line. Mr. Moore will remain on the Pacific Coast for about two weeks visiting offices of his company.

He will arrive in San Francisco on Monday, May 5th, then will proceed to Portland, Seattle and Vancouver.

* * *

The National Supply Co. has announced the election of **Austin W. Clark** as vice president, effective as of April 22, 1941.

Previous to joining The National Supply Co. in August, 1940, as assistant vice president, Mr. Clark, who was born in Anaconda, Montana, and attended the University of California, had been associated for four years with Sears, Roebuck & Co., Chicago, as assistant comptroller. Prior to that time, he was for fourteen years with the Hearst Publications in New York City, as comptroller and treasurer, and was also for four years with the Cerro de Pasco Copper Corporation in Peru, South America.

* * *

Oakland Welcome

The Oakland Naval Supply Base and Oakland Army Quartermaster's Supply Depot were officially welcomed to Oakland at a civic luncheon sponsored by the Oakland Chamber of Commerce in the Ivory Court of Hotel Oakland on April 15th.

Guests of honor included: Lieut. General John L. DeWitt, Commanding General, Fourth Army.

Major General Ernest Peek, Commanding General, Ninth Corps Area.

Brigadier General Arthur Lane, Chief of Staff, Fourth Army.

Brigadier General John C. H. Lee, Port Commander, S. F. Port of Embarcation.

Colonel R. S. Pratt, Plans and Training Officer, Fort Mason.

Colonel John F. Franklin, Executive Officer, Fort Mason.

Colonel Henry C. R. Akin, Asst. Plans and Training Officer, Fort Mason.

Captain David K. Donelson, Assistant to Colonel Pratt.

Rear Admiral A. J. Hepburn, Commandant, Twelfth Naval District.

Captain F. R. McCrary, Commandant, Alameda Naval Air Station.

Captain W. C. Barker, Chief of Staff, Twelfth Naval District.

Captain W. C. Fite, Oakland Naval Supply Base.

Captain C. A. Carlson, General Inspector for Public Works.

Captain H. G. Taylor, Public Works Officer, Twelfth Naval District.

Lieut. Commander E. F. Carr, Oakland Naval Supply Base.

Lieut. M. L. Smith, Aide to Admiral Hepburn.

Commander J. E. Stika, Commanding Officer, Government Island.

* * *

Traffic Meet

The regular monthly meeting of the Pacific Traffic Association will be held at the San Francisco Commercial Club, Tuesday, May 13th, commencing with dinner at 6:30 p. m.

As guest speaker for the evening, the traffic group has been fortunate in securing Paul C. Smith, editor and general manager of the San Francisco Chronicle. Mr. Smith recently returned to San Francisco after a three months' visit to the European continent and has chosen as the subject of his discussion "The War Over Britain." The talk will be broadcast nationwide through the facilities of the Mutual Broadcasting System.

Lester B. Raymond, Secretary-Treasurer, Overland Freight Transfer and President of the Pacific Traffic Association, will preside. He will be assisted by Oliver Vickery, Sales Manager, General Ship Supply Company and program director of the traffic organization. Mr. Vickery will introduce the guest speaker.

* * *

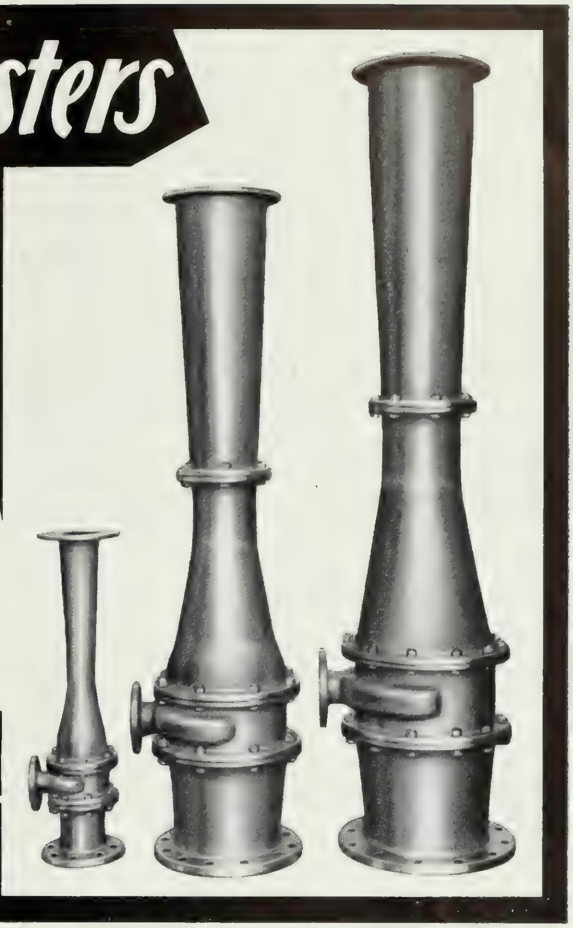
The new location of the General Steamship Corporation is now on the first floor of the Merchants Exchange Building, San Francisco.

S&J Gas Exhausters

Expedite Tanker Sailings

With an S. & J. Steam Jet Gas Exhauster aboard, gas freeing and cleaning oil tanker compartments is no longer dependent upon wind conditions. It is faster and more economical than steaming. Workmen can clean compartments while ventilation continues. Outdoor atmospheric temperature is maintained within the compartment.

A small jet of steam introduced into the exhauster draws in a tremendous volume of fresh air and can maintain that volume indefinitely at very small cost. This Gas Exhauster is made of bronze throughout, is low in first cost, and economical in operation. In time saving alone, it will quickly amortize its cost.



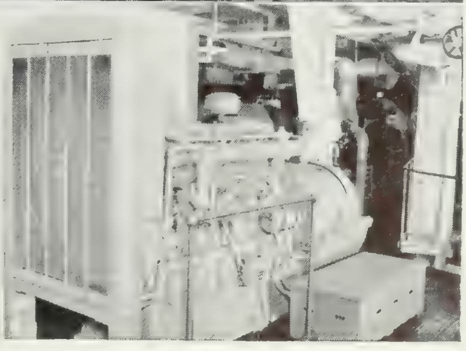
SHAND & JURS COMPANY
BERKELEY · CALIFORNIA
NEW YORK CHICAGO HOUSTON LOS ANGELES

EQUIPPED WITH Superior DIESEL AUXILIARY GENERATOR SET

Standard Oil Tanker M. E. LOMBARDI

THE consistent use of SUPERIOR Diesel generator sets for emergency and stand-by service on modern oil tankers is significant proof of quality and satisfaction.

The unit illustrated, a 50 KW direct current set, has become a recognized standard in this field where safety and dependability are essential factors, and many others like it have been installed in recent months by such blue-ribbon producers as Standard, Socony-Vacuum, Gulf and Union . . . *There are 31 sizes available ranging from 10 to 675 KW.*



SUPERIOR Diesel
Auxiliary Unit

THE NATIONAL SUPPLY COMPANY . . . SUPERIOR ENGINE DIVISION

SALES OFFICES: Springfield, Ohio; Philadelphia, Penna.; New York, N. Y.; Los Angeles, Cal.; Jacksonville, Fla.; Houston, Texas; St. Louis, Mo.; Fort Worth, Texas; Tulsa, Okla.; Boston, Mass. FACTORIES: Springfield, Ohio; Philadelphia, Penna.

John Sanderson

Sperry Election

The election of John Sanderson as Vice-President in Charge of Finance of the Sperry Gyroscope Company was announced on April 2 by R. E. Gillmor, President. At the same time Mr. Gillmor announced that James E. Webb had been elected Treasurer of the company. Both Mr. Sanderson and Mr. Webb will assume their new posts immediately.

James E. Webb

With the Marine Trade

Harold R. Swanton, executive vice president of Precision Bearings, Inc., announced during April that his company has appointed J. W. Minder Chain & Gear Co., 923-29 Santa Fe Ave., Los Angeles, California, as their authorized industrial distributor.

The Minder firm in Los Angeles and Portland will serve the trade with complete stocks of the following nationally-known lines of bearings: Norma Hoffmann Precision bearings, Bower tapered roller bearings, Aetna and PBI thrust bearings, Kilian unground ball bearings, CJB master ball bearings, CJB Pillow blocks, Rollway and PBI roller bearings and Precision Ahlberg ground bearings.

◆

A new name for an old-line marine paint manufacturing firm has been announced by executives of The Federal Composition & Paint Company, Inc., of New York.

Now effective, the new name is THE FEDERAL PAINT COMPANY, INC.

The company has specialized in the manufacture of marine compositions, paints and varnishes for forty years. President is **Andrew Baxter, Jr.,** and **J. M. Howland** is vice president. The Federal organization is well established in principal Coast ports through distributing offices as follows:

Pillsbury & Martignoni in San Francisco; A. T. B. Shields, Seattle, A. J. Chalmers in Portland, and Robert S. Gardner in Wilmington.

There's a new address and telephone number for Guy M. Thompson, manufacturers representative in Seattle. The new location is 24 West Connecticut, just one-half block north and one-half block west of the former location. The telephone number is ELliot 6644, the first change in twelve years. Mr. Thompson represents France Packing Company of Philadelphia, Pa.; Kearfott Engineering Co. of New York City and Xzit Sales Co. of Hoboken, N. J.

◆

San Francisco, April 23.—A quarter of a million dollar magnesia plant that will produce exclusively to fill national defense orders is being rushed to completion by Plant Rubber and Asbestos Works of San Francisco.

R. H. Shainwald, president of the company, said today work had already started on the project and production would begin approximately July 1. The plant's capacity will be $1,250,000 annually.

The plant will be erected on the Emeryville grounds of the Paraffine Cos., Inc., of which Plant Rubber is a subsidiary. "Eighty-five per cent magnesia," an insulating material widely used in national defense projects, will be manufactured exclusively.

Plant Rubber and Asbestos Works has been manufacturing magnesia for 20 years in their factories at Redwood City, but the equipment there was not adequate to handle national defense orders, Shainwald said.

A fund of $1500 donated by employees of Moore-McCormack Lines for the purchase of a mobile kitchen was turned over recently to the British War Society by S. L. Barbera, assistant treasurer of the company, aboard the passenger liner Argentina at Pier 32, North River. W. Horace Whittemore, of the commerce and industry division, accepted the fund on behalf of the Society, and Captain H. S. Mayo, marine superintendent of the company, and H. B. Richardson, commissary superintendent, were also present at the brief ceremony.

More than 500 employees of Moore-McCormack Lines contributed to the fund.

◆

Lykes Engineer Passes

John A. Phelan, conservation engineer for Lykes Bros. Steamship Company, Galveston, Texas, died on March 9. He was with the company since 1930 and, prior to that, with the United States Shipping Board.

Mr. Phelan was born 64 years ago in Easton, Mass., graduated from the Massachusetts Institute of Technology and served during the last World War on transport service. This sad news came to us from Chas. W. Merse of the Galveston, Texas, offices of Lykes Bros. Writes Mr. Merse: "In the passing of John Phelan to the Great Beyond I have lost a very dear friend."

Eliminating a Wet Floor Slipping Hazard

. . . *Alundum Tile*

A STRIP of Alundum Tile replaced the original tile down the entire length of this row of ranges. Now the busy chefs have a safe, sure footing even when liquids are spilled—and the non-slip surface of the Alundum Tile will never wear slippery.

Catalog A gives full information about Alundum Tile. Write for a copy—also for Catalog B which describes Alundum Ceramic Mosaic Tile, another Norton Floors product.

◆

NORTON COMPANY
WORCESTER, MASS.
New York Chicago Detroit
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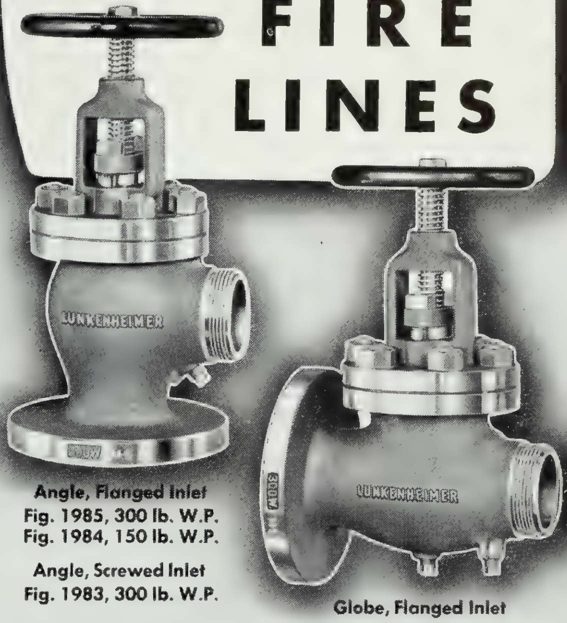
T-479

NORTON FLOORS
ALUNDUM TILES—TREADS—AGGREGATES

For MARINE FIRE LINES



Angle, Flanged Inlet
Fig. 1985, 300 lb. W.P.
Fig. 1984, 150 lb. W.P.

Angle, Screwed Inlet
Fig. 1983, 300 lb. W.P.

Globe, Flanged Inlet
Fig. 1982, 300 lb. W.P.
Fig. 1981, 150 lb. W.P.

Globe, Screwed Inlet
Fig. 1980, 300 lb. W.P.

These new Lunkenheimer designs comply fully with the Rules of the Bureau of Marine Inspection and Navigation.

Regularly made with non-metallic discs, renewable seat rings, and National Standard hose threads on outlet. Threads of other standards available on order; also valves with Cap and Chain..

Ask your local Lunkenheimer distributor for a copy of the bulletin "Lunkenheimer Valves for Marine Service".

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EXPORT DEPT 318 322 HUDSON ST NEW YORK

Naval Reserve

Captain Schuyler F. Cumings, marine superintendent of the United States Lines for the past five years, has been called to active service as a Lieutenant Commander in the Naval Reserve, it was announced on April 19 by A. J. McCarthy, vice president in charge of operations. Captain Cumings will serve as assistant to Captain P. P. Blackburn, director of the Third Naval District in New York. In this post his activities will be concerned mostly with the Merchant Marine Reserve Bureau.

Captain Cumings served in the Navy throughout the last war, during which he rose from ensign to lieutenant commander. He has been in the Naval Reserve since resigning from active service in 1919 to resume his career in the merchant marine, which had been interrupted by the war.

Captain Cumings trained for the sea on the Schoolship Newport, graduating in 1909, and in the New York State Nautical School. He first saw sea service as a deck boy in the three-masted barque Von Foong, carrying sugar machinery from New York to Hawaii around Cape Horn. He entered the service of the United States Lines in 1922 as chief officer and has commanded many ships of the Line, including the Manhattan and Washington. He also served as staff captain of the Leviathan.

Capt. Schuyler F. Cummings

Commodore

Just before the United States liner America sailed from New York on April 12 on a 12-day cruise to the West Indies, President John M. Franklin announced the appointment of Captain Giles C. Stedman, master of America's largest and finest liner, as commodore of the United States Lines. Captain Stedman, one of the best known of American shipmasters, has been in command of the new vessel since she was put into commission last summer. In this new position Captain Stedman follows three noted American shipmasters, Commodore A. B. Randall, who commanded the Manhattan until his retirement in 1939; Commodore Harold A. Cunningham, and Commodore Herbert Hartley, with all of whom he has served in an executive capacity.

Commodore Giles C. Stedman

Although only forty-three years old, probably the youngest man ever to be given a command of such responsibility, Captain Stedman has achieved a notable reputation in his chosen field and has a record of distinguished service at sea that puts him in the top rank of American shipmasters.

He has been at sea for twenty-three years and with the United States Lines since 1922.

Ted Meyer of Federal-Mogul

Hyde Propellers by Federal-Mogul

Of considerable interest to commercial boat operators is the announcement by the Federal-Mogul Corporation, Detroit, Mich., that they have purchased the patterns, designs and existing stocks of all propellers, up to 50 inches diameter, manufactured by the Hyde Windlass Company, Bath, Maine.

The Federal-Mogul Corporation will continue to manufacture, sell and service Hyde propellers, and will continue both existing Hyde and Federal-Mogul dealer organizations.

E. F. Ramsay, superintendent, Propeller Department, Hyde Windlass Company, in announcing that they were relinquishing their interests in this field to Federal-Mogul, explained that there is a tremendous and urgent demand for Hyde windlasses, steering gears and other large ship machinery, and the personnel and plant capacity thus released would be devoted to these vital national defense requirements.

By acquisition of these rights, Federal-Mogul Corporation becomes the world's largest manufacturer of motor boat propellers.

American Bureau Buys Larger Quarters

Due to the necessity of securing additional working space, the American Bureau of Shipping has acquired new headquarters through the purchase of the building at 47 Beaver Street, New York City. Its new home is a steel and concrete fireproof building of modern construction and after alterations have been completed to accommodate the various needs of the Bureau, the transition will be accomplished around April 9th.

America's classification society, now in its 79th year, has been in its present quarters, the Stevenson Taylor Memorial Building, 24-26 Old Slip, since 1927, the building being named in honor of Stevenson Taylor, president of the Bureau from 1916 to 1926. The year 1916 saw the reorganization of the American Bureau of Shipping and 1941 marks the twenty-fifth anniversary of the event. However, this five-story building is now proving greatly inadequate in furnishing the facilities necessary to carry on the tremendous volume of work incidental to the expansion of shipbuilding activity at present under way.

The new location, consisting of six floors and mezzanine, will provide 2½ times the floor area of the former building, and the additional space thus available will enable the Technical Department and the Surveyor's Division to carry on their work even more expeditiously than in the past. The Record Department, responsible for compiling and publishing the Bureau's yearly "Record" book, will be occupants of the entire mezzanine floor. The sixth floor will be reserved for the testing of various shipbuilding materials and as a general scientific department.

The Beaver Street building will be thoroughly modern in every respect. Air conditioning of the building will be employed throughout and working equipment will be of the latest type. New lighting fixtures of the fluorescent type have been installed on every floor. This type of lighting will be particularly advantageous over the drawing boards.

As an indication of the increasing volume of work being handled by the Bureau in recent years, it is interesting to note the number of vessels and gross tonnage of same being built to classification requirements on the first of each year from 1938 to date, as follows:

January 1st, 1938—94 vessels, 283,115 gross tons.
January 1st, 1939—149 vessels, 583,830 gross tons.
January 1st, 1940—238 vessels, 1,167,390 gross tons.
January 1st, 1941—283 vessels, 1,551,878 gross tons.
April 1st, 1941—542 vessels, 3,029,325 gross tons.

From the above, it will be noted that the shipbuilding activity in the past three years has resulted in increasing by six times the number of vessels being built to Bureau class and the gross tonnage being handled has increased almost eleven times. In connection with this, a great volume of plans are submitted to the Bureau for approval. Also, in this connection, numerous reports are received daily from the Bureau's surveyors stationed in shipyards, steel mills and engine building plants all over the country. In addition, numerous periodic and damage surveys are conducted on vessels already in existence.

WITH motor partially recessed in blower casing and direct-connected to wheel, ILG gives you an extremely compact unit that mounts anywhere (wall, deck or ceiling) — saves space, saves weight, slashes installation costs. Send for Catalog EB-381 now!

WHY WASTE THESE VALUABLE INCHES?

▨ "Cross-hatch" area shows EXTRA space required by coupled motor mounted on separate pedestal.

■ Solid black area shows space required by an ILG Direct-Connected Universal Blower.

ORDERS JUST RECEIVED

★ SINCLAIR TANKERS — HULLS 1488 — 1489 — 1490 — 1491
Bethlehem Steel Co., Sparrows Point, Maryland
★ HULLS 227 — 228
Pennsylvania Shipyard, Inc., Beaumont, Texas
★ ALCOA STEAMSHIP CO., HULLS 175 — 176 — 177
Moore Drydock Co., Oakland, California
★ MARITIME COMMISSION C1A CARGO BOATS
The Pusey & Jones Co., Wilmington, Delaware
★ "MILWAUKEE CLIPPER" CAR FERRY
Manitowoc Shipbuilding Co., Manitowoc, Wisconsin

ILG ELECTRIC VENTILATING CO.
2824 N. CRAWFORD AVENUE, CHICAGO, ILL.
Offices in 43 Principal Cities

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Vitalized*
VENTILATION
AND AIR CONDITIONING
*AIR CHANGE...NOT JUST AIR MOVEMENT!

PROGRESS IN *American Shipyards*

Pacific Coast

ASSOCIATED SHIPBUILDERS
Seattle, Wash.

New Construction:

One insulated self-propelled lighter for delivery to U. S. Navy at Puget Sound Navy Yard.

Four small seaplane tenders for delivery to Puget Sound Navy Yard.

Conversion:

City of Newport News to transport U. S. S. Fuller.

ASTORIA MARINE CONSTRUCTION CO.
Astoria, Ore.

New Construction:

Hull No. 1100, wood hull troller. 41′ x 11′ x 4′6″; Chrysler Crown engine. **Delivery date May 1, 1941.**

Hull No. 1090, wood hull trawler for stock. 56′ x 15′6″ x 7′6″; 135-hp Superior diesel engine.

Hull No. 1111, wood hull trawler. 60′ x 12′ x 6′; 100-hp Caterpillar diesel engine. **Delivery date May 1, 1941.**

Four 135′ wooden diesel-powered mine sweepers for U. S. Navy. Delivery in 14 months.

BASALT ROCK CO., INC.
Shipbuilding Yard
Napa, Calif.

New Construction:

Eight steel open lighters; owner, Bureau of Supplies and Accounts, Navy Dept., Washington, D. C. Delivery at Mare Island. 110′ x 34′ x 11′3″. Contract awarded September 5, 1940. **Delivered.**

Twelve steel seagoing 1000-ton cargo barges; contractors, Pacific Navy Air Bases. Delivery at San Francisco Bay. 150′ x 40′ x 12′. Contract awarded November 15, 1940. **Delivery dates, first two about April 15; thereafter one every 7 or 10 days.**

Two 10,000-bbl. fuel oil tankers for delivery to Mare Island Navy Yard. 235′ x 37′ x 19′; cost $1,800,000. Contract awarded by Navy Dept., Bureau of S. & A., Washington, D. C. Keel laying date, May 15, 1941.

BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Division
San Francisco Yard
San Francisco, Calif.

New Construction:

Hulls Nos. 5362-5364, three C-1 cargo vessels for U. S. Maritime Commission. 395′ x 60′ x 37′6″; 6400 gross tons each; 4000-hp. Full scantling steam propulsion type. Keel laid, No. 5364, January 15, 1941. **Launching dates,** No. 5362, January 10, 1941; **No. 5363, March 12, 1941;** No. 5364, June 4, 1941.

Twenty-five 2100-ton destroyers for U. S. Navy.

Hulls Nos. 5366-5367, two 1650-ton destroyers for U. S. Navy. Keels laid January 13, 1941.

Four 6000-ton cruisers for U. S. Navy.

BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Division
San Pedro, Calif.

New Construction:

Ten 2100-ton destroyers for U. S. Navy.

COMMERCIAL IRON WORKS
Portland, Ore.

New Construction:

Four anti-submarine net tenders.

Seven steel mine sweepers for U. S. Navy.

CONSOLIDATED STEEL CORP., LTD.
Los Angeles, Calif.

New Construction:

Hulls Nos. 156-159, four C-1-BT, full scantling, turbine propulsion cargo vessels for U. S. Maritime Commission. **Keel laying date, No. 159, April 1, 1941.** Launching dates, No. 157, March 27, 1941; No. 158, June 26, 1941; No. 159, September 10, 1941. Delivery dates, No. 156, June 12, 1941; No. 157, July 26, 1941; No. 158, October 23, 1941; No. 159, December 23, 1941.

Hulls Nos. 181-182, two Design P1-S2-L2 twin screw turbine propulsion transports for U. S. Maritime Commission. Launching dates January 5 and June 8, 1942. Delivery dates September 26 and November 5, 1942.

Hulls Nos. 162-193; 206-221, 48 steel lighters. Keel laying dates, No. 206, July 1, 1941; No. 207, September 15, 1941. Launching dates, No. 206, February 9, 1942; No. 207, June 8, 1942. Delivery dates, No. 206, Nov. 8, 1942; No. 207, December 18, 1942.

GENERAL ENGINEERING & DRY DOCK CO.
Alameda, Calif.

New Construction:

Four anti-submarine net tenders for U. S. Navy.

Eight mine sweepers for U. S. Navy.

HARBOR BOAT BUILDING CO.
Terminal Island, Calif.

Fifteen 60-foot U. S. Navy boats. First boat launched March 8, 1941.

Four 136′ motor mine sweepers for U. S. Navy.

LAKE WASHINGTON SHIPYARDS
Houghton, Wash.

New Construction:

Four anti-submarine net tenders.
Four thousand A. S. N. T. floats.
Coast and Geodetic Survey ship.
Six seaplane tenders for U. S. Navy.

LOS ANGELES SHIPBUILDING & DRY DOCK CORP.
Los Angeles, Calif.

New Construction:

Hulls Nos. AR6-AR8, three repair vessels for U. S. Navy.

MOORE DRY DOCK CO.
Oakland, Calif.

New Construction:

Hull No. 198, Mormacsun; one C-3 vessel for U. S. Maritime Commission. LOA 492′0″, LBP 465′; breadth molded 69′6″; depth molded 42′6″. **Delivery date May 1, 1941.**

Hulls Nos. 199-200, two caisson gates for Bureau of Yards and Docks; one for D. D. No. 2, Pearl Harbor, T. H.; one for D. D. No. 5, Puget Sound, Wash. 150′ x 22′ x 57′; 1800 tons weight. Launching date, No. 200, March 18, 1941. **Delivery dates May 15** and June 1, 1941.

Hulls Nos. 201-203, three cargo and passenger vessels for U. S. Maritime Commission and Alcoa Steamship Co. 442′x62′x25′; depth molded to bridge deck 41′6″; 8500 hp; 17 knots speed; passenger carrying capacity 38. Keel laying dates March 26, June 16 and September 10, 1941. Estimated delivery dates January 1, March 15 and June 1, 1942.

Hulls Nos. 204-206, three defense vessels for U. S. Navy and Dravo Corp. 110′ x 34′ x 11′3″ molded depth; two diesel-driven generators.

Two submarine tenders for U. S. Navy.

Five submarine rescue vessels for U. S. Navy.

Six C-2 cargo vessels.

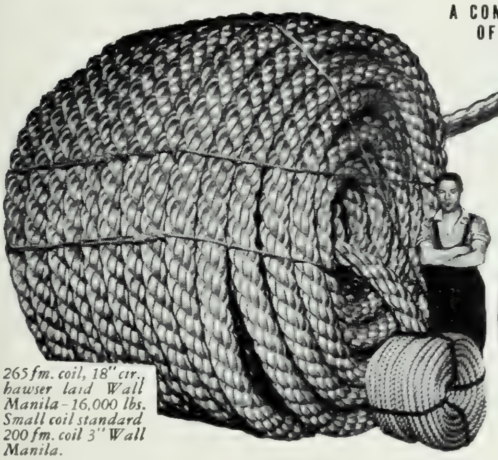
MARINE PAINTS FOR EVERY NEED

PACIFIC PAINT & VARNISH CO.

544 Market Street - SAN FRANCISCO - EXbrook 3038

A COMPLETE LINE OF CORDAGE

SPECIFIED FOR ALL REQUIREMENTS



265 fm. coil, 18" cir. hawser laid Wall Manila–16,000 lbs. Small coil standard 200 fm. coil 3" Wall Manila.

Reliable

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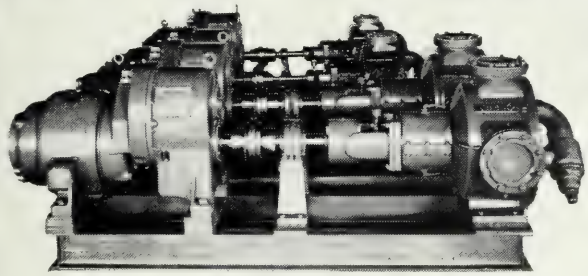
Manila ROPE

Heavy duty Marine Cordage, Wrecking Lines, Deep-sea Hawsers, made on the longest rope-walk in the world.

WALL ROPE WORKS, Inc.

333 Montgomery St., San Francisco, Cal.

ALL SET TO SET RECORDS



Here are 4 Viking Tanker and Barge Unloading Pumps all set for shipment to an eastern terminal . . . their installation will mean new unloading speed, reduced repair and replacement costs, cleaner tank stripping.

The two front pumps are 1050 GPM at 150 RPM—the two back pumps are 750 GPM at 200 RPM. All are directly connected by flexible couplings to gear head motors . . . all are equipped with Viking valve on head and water cooled rotor bearings with integral thrust bearings attached Each unit is mounted on a rugged, reinforced structural steel base.

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VIKING PUMP COMPANY
CEDAR FALLS IOWA

Everything in . . .

DECK COVERINGS

Our organization is equipped to handle all types of exterior and interior deck covering installations, including weather decks, awnings, decks of quarters, refrigerators, passageways, toilet rooms, etc.

Our products include

MASTIPAVE
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CERAMIC TILE
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RUBBER TILE
ASPHALT TILE
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MALOTT & PETERSON

SAN FRANCISCO

20th and Harrison Sts. Phone ATwater 1600

Conversion:

Hull No. 195, U. S. S. Tangier, to seaplane tender for U. S. Navy.

OLSON & SUNDE MARINE WORKS
Seattle, Wash.

New Construction:

One 57-foot combination salmon seine diesel boat for Henry Bowman, Wrangell, Alaska. Cost, with equipment, $24,000. **Completion date April 1, 1941.**

PACIFIC BRIDGE CO.
San Francisco, Calif.

New Construction:

One seagoing drydock for U. S. Navy. Cost $1,649,000.

PACIFIC DRY DOCK & REPAIR CO.
Oakland, Calif.

New Construction:

One all-welded steel oil barge. 148′ x 38′ x 9′; 300,000 gal. capacity.

Lighters. Cost $284,572.

SEATTLE-TACOMA SHIPBUILDING CORP.
Tacoma, Wash.

PLANT No. 1

New Construction:

Hulls Nos. 1-2; No. 3, Cape Cleare; No. 4, Cape Fairweather; No. 5, Cape Douglas, five C-1 cargo vessels for U. S. Maritime Commission. Single screw, full scantling diesel propulsion type. Two General M. A. N. 2100-hp engines; 14 knots speed. **Launching dates, No. 4, April 11, 1941; No. 5, May 20, 1941. Delivery dates, No. 1, April 3, 1941; No. 2, May 30, 1941;** No. 3, July 15, 1941; No. 4, June 30, 1941; No. 5, August 15, 1941.

Hulls Nos. 6-7, 2 C-3 shelter deck type cargo steamers for U. S. Maritime Commission. To be converted on completion to U. S. Army troopships. **Keel laying dates, April 25** and June 3, 1941. Launching dates, August 15 and October 1, 1941.

Hulls Nos. 8-11, four C-3 cargo ships for U. S. Maritime Commission. 465′ x 69′6″ x 42′6″ (molded); 8900 tons; 8500-hp steam turbine propulsion; cost $2,990,000. Keel laying dates, August 22, October 8, December 29, 1941, and January 22, 1942. Launching dates, December 18, 1942, and January 15, March 29, April 22, 1942.

SEATTLE PLANT

New Construction:

Twenty-five destroyers for U. S. Navy.

WESTERN PIPE AND STEEL CO.
South San Francisco, Calif.

New Construction:

Hulls Nos. 59-61, three C-1 cargo vessels for U. S. Maritime Commission. Full scantling diesel propulsion type; single screw; two Busch - Sulzer 2100-hp engines. **Delivery dates, May 16,** July 15 and September 13, 1941.

Hulls Nos. 62-65, four C-3 cargo ships for U. S. Maritime Commission. 492′ x 69′ x 42′6″; 8900 tons; 8500-hp; steam propulsion; $2,990,000 each. Keel laying dates, February 28, May 5, August 1 and September 30, 1941. Launching dates July 15, September 15, December 5, 1941, and January 15, 1942. Delivery dates, February 24, May 5, May 15 and June 24, 1942. All above dates estimated.

Navy life floats.

TODD-CALIFORNIA SHIPBUILDING CORP.
Richmond, Calif.

New Construction:

Thirty cargo vessels for British Purchasing Commission. 10,000 dwt; 416′ long, 57′ beam. Cost $50,000,000.

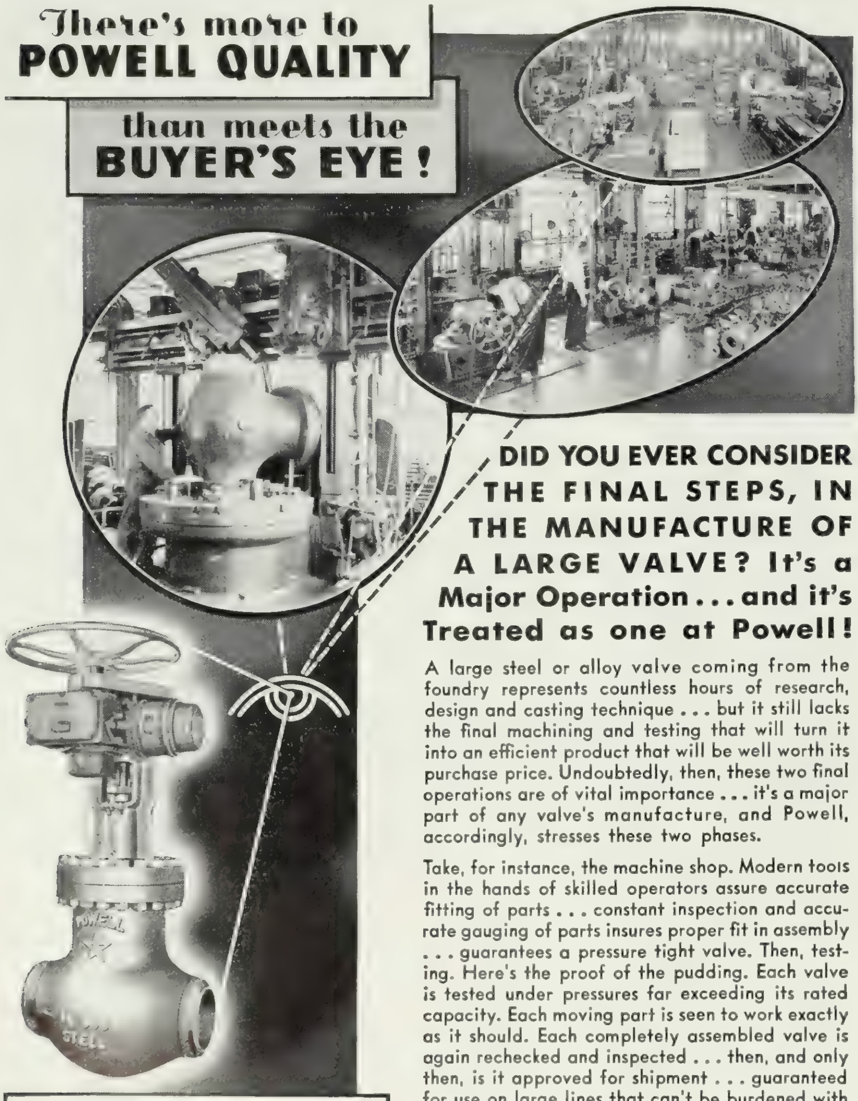
TODD-SEATTLE DRY DOCKS
Seattle, Wash.

Conversion work.

WESTERN BOAT BUILDING CO., INC.
Tacoma, Wash.

New Construction:

Hull No. 144, U. S. S. Phoebe, coast mine sweeper. Completion date, May 1, 1941.



There's more to
POWELL QUALITY
than meets the
BUYER'S EYE!

DID YOU EVER CONSIDER THE FINAL STEPS, IN THE MANUFACTURE OF A LARGE VALVE? It's a Major Operation . . . and it's Treated as one at Powell!

A large steel or alloy valve coming from the foundry represents countless hours of research, design and casting technique . . . but it still lacks the final machining and testing that will turn it into an efficient product that will be well worth its purchase price. Undoubtedly, then, these two final operations are of vital importance . . . it's a major part of any valve's manufacture, and Powell, accordingly, stresses these two phases.

Take, for instance, the machine shop. Modern tools in the hands of skilled operators assure accurate fitting of parts . . . constant inspection and accurate gauging of parts insures proper fit in assembly . . . guarantees a pressure tight valve. Then, testing. Here's the proof of the pudding. Each valve is tested under pressures far exceeding its rated capacity. Each moving part is seen to work exactly as it should. Each completely assembled valve is again rechecked and inspected . . . then, and only then, is it approved for shipment . . . guaranteed for use on large lines that can't be burdened with inefficient valves.

So, in summing up the important operations that go into the building of a large valve, it can be seen that machining and testing stand near the top . . . that they are very necessary in assuring "quality, through and through"—a phrase truly applicable to every Powell product.

You Need More Than a Photograph of the Finished Product to See ALL the Qualities that Make Powell Valves Uniquely Able to Better Serve Your Requirements

POWELL VALVES
THE WM. POWELL COMPANY • CINCINNATI, OHIO

Hull No. 145, Anna M., live bait tuna boat. Lauching date, April 5, 1941.

Hull No. 146, fishing boat, 95′ x 24′ x 11′. **Keel laid April 15, 1941.**

Two 136′ mine sweepers for U. S. Navy. Keel laying date, May, 1941.

Conversion:

Fishing boats Majestic and Mahree Star, Ketchikan, Rio Del Mar, Valiant and Challenger conversion to naval use.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY
Pittsburgh, Pa.

New Construction:

Ten freight barges for Inland Waterways Corp., St. Louis, Mo. 280′ x 48′ x 11′.

Eight dump scows. 160′ x 50′6″ x 13′6″; for Panama Canal.

Two fueling scows for Carnegie Illinois Steel Co. 125′ x 26′ x 11′.

THE AMERICAN SHIP BUILDING CO.
Cleveland, Ohio

New Construction:

Twelve net tenders for U. S. Navy; (6 at Lorain, Ohio; 6 at Cleveland, Ohio). 151′8″ x 30′6″ x 16′6″; diesel-electric propulsion; contract price $6,357,000.

Four diesel trawlers for General Seafoods Corp. 146′8″ L. O. A. x 26′0″ x 14′4″. (2 at Lorain, Ohio; 2 at Cleveland, Ohio.) Delivery date, November 15, 1941.

Eight mine sweepers (2 at Lorain, Ohio; 2 at Cleveland, Ohio) for U. S. Navy; 220′ O.A. x 32′ x 17′.

Two bulk freighters (at Lorain, Ohio) for Pittsburgh Steamship Company; 640′ O.A. x 67′ x 35′.

BATH IRON WORKS
Bath, Maine

New Construction:

Hull No. 182, DD437, Woolsey; 1620-ton destroyer for U. S. Navy. Delivery date July, 1941.

Hulls Nos. 184-187, four cargo ships for American Export Lines. 400′ x 60′ x 39′. Delivery dates September and October, 1941, and April and June, 1942.

Hulls Nos. 188-189, DD457 and DD458, two destroyers for U. S. Navy. Delivery dates December, 1941, and February, 1942.

Hulls Nos. 190-195, DD449-451, 467-469, six destroyers for U. S. Navy.

Hulls Nos. 196-206, DD507-DD517, eleven destroyers for U. S. Navy.

Hulls Nos. 208-213; DD629-DD631; DD 642-DD644; six destroyers for U. S. Navy.

BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Division

Fore River Yard
Quincy, Mass.

New Construction:

Hull No. 1478, Massachusetts, 35,000-ton battleship for U. S. Navy. Keel laid July 20, 1939.

Hulls Nos. 1479, San Diego; and 1480, San Juan; two 6000-ton cruisers for U. S. Navy. Keels laid March 27 and May 15, 1940.

Hull No. 1484, cargo vessel for U. S. Maritime Commission. 450′ x 66′ x 42′3″; 16½ knots; geared turbines and water tube boilers; 14,500 tons. Launching date November 16, 1940.

Hulls Nos. 1485-1487, three tankers. 502′ x 68′ x 37′; 21,000 tons. Keels laid July 1, August 7 and September 26, 1940. Launching date, No. 1485, March 15, 1941.

Hulls Nos. 1488-1491, four tankers for Sinclair Refining Co., 10,700 tons dwt. Keels laid, No. 1488, November 21, 1940; No. 1489, March 18, 1941.

Hulls Nos. 1492-1493, two tankers for Sinclair Refining Co. 15,450 tons dwt.

Hulls Nos. 1494-1497, four heavy cruisers for U. S. Navy.

Hulls Nos. 1498-1501, four light cruisers for U. S. Navy.

Hulls Nos. 1502-1503, two light cruisers for U. S. Navy.

Hulls Nos. 1504-1507, four heavy cruisers for U. S. Navy.

Hulls Nos. 1508-1511, four aircraft carriers for U. S. Navy.

Hulls Nos. 1512-1515, four trawlers. Keels laid, Nos. 1512-1513, March 26, 1941.

Hulls Nos. 1516-1519, four 1650-ton destroyers for U. S. Navy.

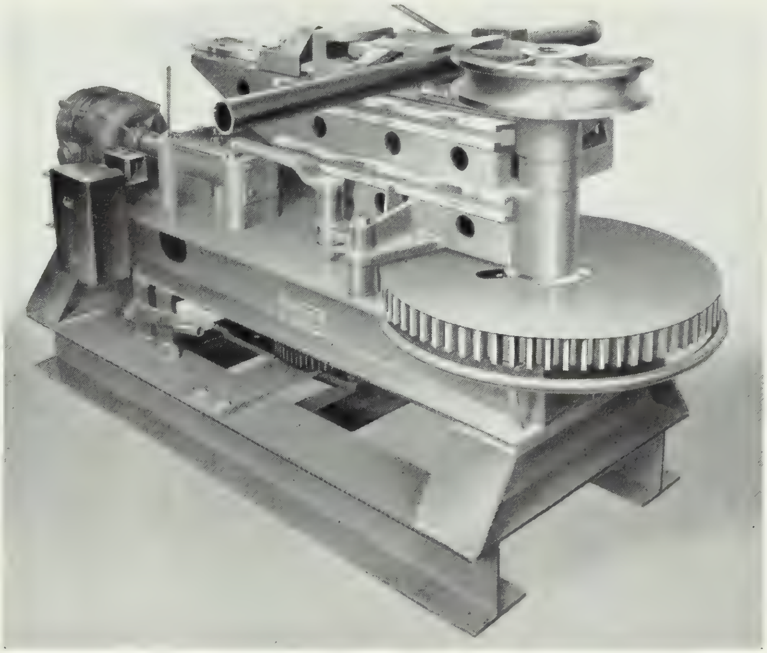
BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Division

Sparrows Point Yard
Sparrows Point, Md.

New Construction:

Hull No. 4343, Robin Kettering; cargo vessel for Seas Shipping Co. LOA 485′, beam

"IN A CLASS BY ITSELF"



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Of the shipbuilding firms whose orders we have on hand, we cite two who have experienced continuous use without breakdown or failure in twenty years:

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Moore Dry Dock Company

U. S. PIPE BENDING CO.

249 FIRST STREET . . . SUtter 3114 . . . SAN FRANCISCO

Jobbers: Steel Pipe and Fittings
Distributors: Harrisburg Steel Flanges

66′, draft 43′. Launching date January 18, 1941.

Hulls Nos. 4346, Thompson Lykes; 4348; two C-1 cargo vessels. LOA 417′, LBP 395′, beam 60′, depth 37′6″. Launching date, No. 4346, December 21, 1940.

Hulls Nos. 4350-4352, three cargo vessels for Seas Shipping Co. 450′ x 66′ x 34′; 6300 hp; 8500 gross tons.

Hulls Nos. 4353-4356, four oil tankers for Socony Vacuum Oil Co. 487′6″ x 68′ x 37′; 12,000 hp; 9800 gross tons.

Hull No. 4357, oil tanker for Union Oil Co. of Calif. 442′ x 63′ x 34′10″; 3500 hp; 8000 gross tons.

Hulls Nos. 4358-4359, two oil tankers for Socony Vacuum Oil Co. 487′6″ x 68′ x 37′; 12,000 hp; 9800 gross tons.

Hulls Nos. 4360-4361, two oil tankers for Union Oil Co. 442′ x 64′ x 34′10″; 3500 hp; 8000 gross tons.

Hulls Nos. 4362-4364, three cargo and passenger vessels for Mississippi Shipping Co. 465′ x 65′6″ x 39′9″; 8600 hp; 8300 gross tons.

Hull No. 4365, oil tanker for Richfield Oil Co. 442′ x 64′ x 34′10″; 3500 hp; 8000 gross tons.

Hulls Nos. 4367-4368, two oil tankers for Panama Transport Co. 487′6″ x 68′ x 37′; 7000 hp; 9800 gross tons.

Hull No. 4369, oil tanker for Continental Oil Co. 442′ x 64′ x 34′10″; 3500 hp; 8000 gross tons.

Hulls Nos. 4371-4372, two oil tankers for Gulf Oil Co. 442′ x 64′ x 34′10″.

Hull No. 4373, tanker for Panama Transport Co. 487′6″ x 68′ x 37′; 7000 hp; 9800 gross tons.

Hulls Nos. 4374-4375, two tankers for Union Oil Co. of Calif. 487′6″ x 68′ x 37′; 7000 hp; 9800 gross tons.

BETHLEHEM STEEL COMPANY, INC.

Shipbuilding Division

Staten Island Yard

Staten Island, N. Y.

New Construction:

Hulls Nos. 8016-8019, four C-1-B design cargo vessels for U. S. Maritime Commission.

Hulls Nos. 8021-8022, two destroyers for U. S. Navy.

Hulls Nos. 8023-8029; 8033-8035; ten destroyers for U. S. Navy.

IRA S. BUSHEY & SONS, INC.

Brooklyn, N. Y.

New Construction:

Hull No. 486, tug. 100′; 805-hp **F-M** diesel. **Delivery date, May, 1941.**

Hull No. 490, tug. 90′; 805-hp **F-M** diesel. Delivery date, July, 1941.

Hull No. 491, wooden drydock section for Bethlehem Steel Co. **Delivery date, April 15, 1941.**

Hull No. 493, tug. 100′; 805-hp **F-M** diesel. **Delivery date, May, 1941.**

Hull No. 494, tug. 90′; 805-hp **F-M** diesel. Delivery date, July, 1941.

Hull No. 496, tug. 90′; 805-hp **F-M** diesel. Delivery date, August, 1941.

Hull No. 497, tug. 90′; 805-hp **F-M** diesel. Delivery date, September, 1941.

Hull No. 498, 156-foot oil tanker. Delivery date, November, 1941.

Hull No. 499, 156-foot oil tanker. Delivery date, January, 1942.

Hull No. 500, wooden drydock section for Bethlehem Steel Co. Delivery date, October, 1942.

CHARLESTON SHIPBUILDING & DRYDOCK COMPANY

Charleston, South Carolina

New Construction:

Six 205′ mine sweeping fleet tugs. Delivery for all within 26 months.

CRAMP SHIPBUILDING COMPANY

Philadelphia, Pa.

New Construction:

Six cruisers, Cleveland class, for U. S. Navy.

DEFOE BOAT & MOTOR WORKS

Bay City, Mich.

New Construction:

Hull No. 167, PC452, sub-chaser for U. S. Navy. 174′ long. **Delivery date, May, 1941.**

Hulls Nos. 168 - 170, YT149 - YT151, three harbor tugs for U. S. Navy. 100′ long. **Delivery date, May 1, 1941.**

Hulls Nos. 171-174, four mine sweepers for U. S. Navy, 220′ long.

Twelve 165-foot escort vessels for U. S. Navy.

THE DRAVO CORPORATION

Engineering Works Division

Pittsburgh, Pa., and Wilmington, Del.

New Construction:

Hull No. 1701, one welded cargo float for Pennsylvania R. R., Philadelphia, Pa. 250′ x 34′ x 9′1″; 594 gross tons.

Hulls Nos. 1748-1749, two type W-7 welded coal barges for stock. 175′ x 26′ x 10′8″; 944 gross tons.

Hulls Nos. 1774-1775, 1846-1853, ten steel lighters for U. S. Navy Dept., Washington, D. C. 110′ x 34′ x 11′3″; 3340 gross tons.

Hulls Nos. 1785 - 1790, six sand and gravel barges for Keystone Sand Division. 135′ x 27′ x 8′; 1530 gross tons.

Hulls Nos. 1801-1811, eleven gate vessels for Bureau S. & A., Navy Dept., Washington, D. C. 3410 gross tons.

Hull No. 1815, one fabricated steel hull oil barge for Pacific D. D. & Repair, San Francisco, Calif. 195′ x 35′ x 9′9″; 598 gross tons.

Hulls Nos. 1816-1830, fifteen type W-7 welded steel bulk cargo barges for stock. 175′ x 26′ x 10′8″; 7080 gross tons.

Hulls Nos. 1831-1834, four welded steel oil barges for stock. 195′ x 35′ x 9′9″; 2392 gross tons.

Hulls Nos. 1835-1840, six escort vessels for U. S. Army, Washington, D. C. 2010 gross tons.

Hulls Nos. 1841 - 1845, five double-bottom covered cargo barges for stock. 175′ x 26′ x 11′; 2650 gross tons.

Hulls Nos. 1854-1855, two welded steel deck barges for Newport News S. B. and D. D. Co. 40′ x 20′ x 4′; 52 gross tons.

Hulls Nos. 1856-1861, six sand and gravel barges for Keystone Sand Division. 135′ x 27′ x 8′; 1530 gross tons.

Hulls Nos. 1862-1867, six welded steel oil barges for stock, 195′ x 35′ x 9′9″; 3588 gross tons.

Hulls Nos. 1868-1869, two 25-ton floating cranes, one each to Phil. and Norfolk U. S. Navy Yards, for U. S. Navy Dept., Washington, D. C.; 670 gross tons.

Hulls Nos. 1870-1875, six welded steel deck barges for Delaware, Lackawanna & Western R. R., 100′ x 30′ x 9′6″; 1392 gross tons.

Hulls Nos. 1878-1902, twenty-five welded hopper barges for Pittsburgh Coke & Iron Co.; 175′ x 26′ x 11′; 11,800 gross tons.

Hulls Nos. 1904-1906, three welded sand and gravel barges for Cumberland River Sand Company; 130′ x 24′6″ x 6′6″; 579 gross tons.

Hulls Nos. 1907-1911, five 165′ type AM mine sweepers for Bureau Supplies & Accounts, U. S. Navy Dept., Washington, D. C.; 1675 gross tons.

Hulls Nos. 1912-1916, five 165′ type PC submarine chasers for Bureau of Supplies & Accounts, U. S. Navy Dept., Washington, D. C.; 1675 gross tons.

Hulls Nos. 1917-1926, ten type W-7 welded bulk cargo barges for stock; 175′ x 26′ x 10′8″; 4720 gross tons.

THE FEDERAL SHIPBUILDING AND DRY DOCK COMPANY

Kearny, N. J.

New Construction:

Hulls Nos. 168-169, CL51, Atlanta; and CL52, Juneau; two 6000-ton cruisers for U. S. Navy. Keels laid April 22 and May 27, 1940.

Hulls Nos. 179-186, eight C-2 cargo ships for U. S. Maritime Commission. Keel laid, No. 179, December 27, 1940.

Hulls Nos. 187-188, two cargo vessels for Matson Navigation Co. Keels laid November 12 and 22, 1940. **Launching date April 12, 1941.**

Hull No. 189, one tanker for Pan American Petroleum and Transport Co. 13,000 dwt. tons. **Delivered March 4, 1941.**

Hulls Nos. 190-193, four tankers for Sinclair Refining Co. 15,000 dwt. Keel laid, No. 190, November 12, 1940.

Hulls Nos. 194-197, four destroyers for U. S. Navy. Keels laid, Nos. 194-195, December 2, 1940; Nos. 196-197, December 16, 1940.

Hulls Nos. 198-203, six destroyers for U. S. Navy.

Hulls Nos. 204-205, two destroyers for U. S. Navy.

Hulls Nos. 206-213, eight destroyers for U. S. Navy.

Hulls Nos. 214-218, five destroyers for U. S. Navy.

Hulls Nos. 219-221, three cruisers for U. S. Navy.

Hulls Nos. 222-227, six destroyers for U. S. Navy.

Hull No. 228, one C-2 cargo ship for U. S. Maritime Commission. Keel laid, February 10, 1941.

Hulls Nos. 229-230, two destroyers for U. S. Navy.

Hulls Nos. 231-232, two destroyers for U. S. Navy.

Hulls Nos. 233-240, eight cargo ships for the U. S. Maritime Commission.

GULFPORT BOILER & WELDING WORKS, INC.

Port Arthur, Texas

New Construction:

Hulls Nos. 167-168, two diesel-electric tugs for General Motors Corp. 100′ x 24′ x

12'4"; 1000 shp G. M. diesel and auxiliary each. **Delivery dates, No. 167, May, 1941;** No. 168, June, 1941.

Hull No. 176, diesel tug for General Motors Corp. 100' x 24' x 12'4"; 680 hp. Delivery date, July 30, 1941.

Hull No. 177, diesel tug for Deepwater Oil Terminals Co., Houston, Tex. 70' x 18' x 10'5"; 400 hp. **Delivery date, April 30, 1941.**

Hulls Nos. 181-184, four oil barges for Butcher-Arthur Corp., Houston, Texas. 150' x 28' x 8'. **Delivery dates, No. 181, May 1; No. 182, May 12; No. 183, May 24;** No. 184, June 10, 1941.

Hulls Nos. 185-187, three oil barges for Butcher-Arthur Corp., Houston, Texas. 165' x 36' x 10'9". Delivery dates, No. 185, July 15; No. 186, July 30; No. 187, August 15, 1941.

Hull No. 189, diesel tug for General Motors Corp. 100' x 24' x 12'4"; 680 hp.

GULF SHIPBUILDING CORP.

Chickasaw, Ala.

New Construction:

Four 2100-ton destroyers for U. S. Navy.

Four vessels for Waterman Steamship Corporation. 445' x 63' x 40'6"; shelter deck type; geared turbine drive; 15½ knots service speed.

THE INGALLS SHIPBUILDING CO.

Pascagoula, Miss., and Decatur, Ala.

Pascagoula

New Construction:

Hull No. 256; C-3 cargo vessel. Completion date, May, 1941.

Hulls Nos. 268, 297-299, four C-3-IN passenger-cargo vessels for U. S. Lines. Completion dates, May, November, December, 1942; and February, 1943.

Hulls Nos. 265-267, three C-3-P passenger-cargo vessels for American-South African Line, Inc. Completion dates, November, December, 1941; and January, 1942.

Hulls Nos. 293-296, four C-3-S-A-2 cargo vessels for U. S. Maritime Commission. Completion dates, February, March, May and June, 1942.

Decatur

New Construction:

Hulls Nos. 304-306, three grain barges for Tennessee Valley Sand & Gravel Co., Sheffield, Ala. 175' x 26' x 11'. **Delivery date, April 20, 1941.**

Hull No. 307, oil barge for Stoll Oil Refining Company of Louisville, Ky. 195' x 35' x 9'9". **Delivery date, May 18, 1941.**

Hull No. 308, oil barge for Independent Oil Co., Dothan, Ala. 195' x 35' x 9'9". **Delivery date, May 1, 1941.**

Hull No. 309, landing barge for Government of Venezuela. 295' x 49'3" x 7'6"; barge No. 1. Delivery date, July 1, 1941.

Hull No. 310, landing barge for Government of Venezuela. 147'6" x 34'6" x 7'6"; barge No. 2. Delivery date, July 1, 1941.

Hull No. 311, landing barge for Government of Venezuela. 60' x 34'6" x 5'; barge No. 3. Delivery date, July 1, 1941.

Hull No. 312, ferry float and ramp for Government of Venezuela. 24' x 30' x 5'. Delivery date, July 1, 1941.

Hulls Nos. 313-314, two sand and gravel barges for stock. 110' x 26' x 6'6". Delivery date, August 15, 1941.

Hulls Nos. 315-317, three 39,000-bbl oil barges for Eddie Erlbacher, Cape Girardeau, Mo. 195' x 35' x 9'9".

Hulls Nos. 318-319, two deck barges for West Virginia Pulp and Paper Co., N. Y. 105' x 32' x 7'.

Hulls Nos. AN 1-4, four net layers for U. S. Navy.

LEVINGSTON SHIPBUILDING CO.

Orange, Texas

New Construction:

Hull No. 160, tug for General Motors Corp. 85' x 22' x 9'; 800-hp diesel.

Hull No. 185, tug for U. S. Navy.

Hulls Nos. 187-188, 199, three tugs for River Terminals Corp. 85' x 23' x 9'6"; 600-hp Cooper-Bessemer engines.

Hull No. 190, tug for Sabine Towing Co., Port Arthur, Texas. 74' x 20' x 9'; 400-hp diesel.

Hull No. 193, one 8600-bbl barge for stock.

Hulls Nos. 194-195, two tugs for stock. 66' x 17' x 7'7".

Hull No. 196, tug for stock. 74' x 20' x 9'; 400-hp diesel.

Hulls Nos. 197-198, two 10,000-bbl stock barges (oil).

Los Angeles
Shipbuilding and Drydock
Corporation

LOS ANGELES HARBOR...SAN PEDRO, CALIFORNIA

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Hulls Nos. 200-201, two 8600-bbl barges for stock.

Hull No. 202, tug for stock. 74′ x 20′ x 9′; 400-hp Atlas diesel.

Hull No. 203, 85′ coastwise tug for stock; 400-hp Atlas diesel.

Hulls Nos. 204-205, two 8600-bbl stock barges (oil).

Hull No. 206, 74′ Hartford tug for stock; 400-hp Atlas diesel.

JOHN H. MATHIS CO.
Camden, N. J.

New Construction:

Four anti-submarine net tenders for U. S. Navy.

One bulk carrier tanker 265′ long for Thos. Bowes, N. A.

NEWPORT NEWS SHIPBUILDING & DRYDOCK CO.
Newport News, Va.

New Construction:

Hull No. 372. Sold to U. S. Navy for conversion to naval auxiliary. Gross tonnage about 11,500 tons; LBP 525′, breadth molded 75′, depth molded 39′. Launched September 18, 1940.

Hull No. 378, battleship 58, Indiana, for U. S. Navy. Keel laid November 20, 1939.

Hulls Nos. 383-384, two single screw combination passenger and cargo vessels for U. S. Maritime Commission. 465′ x 69′6″ x 42′6″; gross tonnage about 9100 tons. Delivery date, No. 383, June, 1941.

Hull No. 385, aircraft carrier No. 8, Hornet, for U. S. Navy. Launched December 14, 1940.

Hull No. 386, single-screw combination passenger and cargo vessel for U. S. Maritime Commission. 465′ x 69′6″ x 42′6″; gross tonnage about 9100 tons. Delivery date, October, 1941.

Hulls Nos. 387-388, two single-screw cargo vessels for Matson Navigation Co. 465′ x 69′6″ x 42′6″; gross tonnage about 7700. **Delivery dates, May 25** and **July 1,** 1941.

Hull No. 389, one single-screw cargo vessel for International Freighting Corp., Inc. 435′ x 63′ x 40′6″; gross tonnage about 8000. Delivery date, August 1, 1941.

Hulls Nos. 390-391 (CL62-CL63), two light cruisers for U. S. Navy.

Hulls Nos. 392-394 (CV9-CV11), three aircraft carriers for U. S. Navy.

Hulls Nos. 395-398 (CV12-CV15), four aircraft carriers for U. S. Navy.

Hulls Nos. 399-400 (CL80-CL81), two light cruisers for U. S. Navy.

THE NEW YORK SHIPBUILDING CORPORATION
Camden, N. J.

New Construction:

BB57, South Dakota, battleship for U. S. Navy. Keel laid July 5, 1939.

AR5, Vulcan, repair ship for U. S. Navy. Keel laid December 26, 1939.

CL55, Cleveland; and CL56, Columbia; two cruisers for U. S. Navy. Order placed March 23, 1940.

CL57 and CL58, two cruisers for U. S. Navy. Order placed June 12, 1940.

AV7, Currituck, seaplane tender for U. S. Navy.

CL59-CL61, three cruisers for U. S. Navy.

CB1-CB6, six cruisers for U. S. Navy.

CL76, four cruisers for U. S. Navy.

THE PUSEY & JONES CORP.
Wilmington, Del.

New Construction:

Hulls Nos. 1080-1081, two automobile and passenger ferries for Delaware-New Jersey Ferry Co. 206′ x 65′ x 16′; 750 gross tons; Una-Flow steam machinery; 1400 shp; 15 mph speed. Launching date, February 1, 1941.

Hulls Nos. 1082, Hains; and 1083, Hoffman; two seagoing hopper dredges for War Dept., U. S. Engineers Office, Philadelphia, Pa. 215′10½″ x 40′ x 15′6″; approx. 2000 gross tonnage; diesel-electric propulsion, 950 shp. Delivery dates, February and August, 1942.

SUN SHIPBUILDING AND DRY DOCK COMPANY
Chester, Pa.

New Construction:

Hulls No. 186, Rio Hudson; No. 187, Rio Parana; No. 188, Rio de la Plata; No. 189, Rio de Janeiro; four C-3 cargo and passenger liners for Moore-McCormack Lines. 492′ x 69′6″ x 42′6″; 8500 gross tons; diesel propelled; 8500 shp; 16½ knots. Delivery dates, August, Stepember, October and November, 1941.

Hulls Nos. 199-206, eight C-2 cargo vessels for U. S. Maritime Commission. 474′ x 63′ x 40′6″; 7400 gross tons; diesel propelled; 7500 shp; 16 knots. **Launching dates, No. 199, May 24;** No. 200, June 21; No. 201, July 21; No. 202, September 6; No. 203, October 4; No. 204, November 11, 1941; Nos. 205-206, 1942. Delivery dates, No. 199, July; No. 200, August; No. 201, September; No. 202, November; No. 203, December, 1941; Nos. 204-206, 1942.

Hull No. 207, Esso Williamsburg, tanker for Panama Transport Co. 547′3″ x 70′ x 40′; 11,300 gross tons; diesel propelled; 7500 shp; 15 knots. **Delivery date, May 15, 1941.**

Hulls Nos. 208-210, three tankers for Petroleum Shipping Co. 520′ x 68′ x 37′; 10,400 gross tons; turbine; 4000 shp; 13 knots. **Launching dates,** No. 208, March 29; **No. 209, May 10;** No. 210, June 9, **1941. Delivery dates, No. 208, May 31;** No. 209, August; No. 210, September, 1941.

Hull No. 211, tanker for Atlantic Refining Co. 543′10″ x 70′ x 40′; 11,600 gross tons; turbo-electric; 500 shp; 13 knots. **Delivery date, April 2, 1941.**

Hulls Nos. 213-216; 219-220, six tankers for Panama Transport Co. 547′3″ x 70′ x 40′; 11,400 gross tons; 7500 shp; 15 knots speed. Launching and delivery dates, 1942-1943.

Hulls Nos. 217-218, two tankers for Standard Oil Co. of N. J. 547′3″ x 70 x 40′; 11,400 gross tons; 7500 shp; 15 knots speed Launching dates, No. 217, August 19; No. 218, October 18, 1941. Delivery dates, No. 217, October; No. 218, December, 1941.

Hulls Nos. 221-222, two tankers for Keystone Tankship Corp. 520′ x 68′ x 37′; 10,600 gross tons; turbine; 12,000 shp; 16½ knots. Keel laying dates, November 15 and December 15, 1941. Launching dates, No. 221, November 22, 1941; No. 222, 1942. Delivery dates, No. 221, January, 1942; No. 222, 1942.

Hulls Nos. 223-225, three tankers for The Texas Co. 513′10″ x 68′ x 36′; 9300 gross tons; turbine; 9000 shp; 16 knots. Launching and delivery dates, 1942.

Hull No. 226, tanker for Kaymar Tankship Corp. 520′ x 68′ x 37′; 10,600 gross tons; turbine; 12,000 shp; 16½ knots. Keel laying date, 1942.

Hulls Nos. 227-228, two tankers for Seamar Tankship Corp. 520′ x 68′ x 37′; 10,600 gross tons; turbine; 12,000 shp; 16½ knots. Keel laying dates, 1942.

Hull No. 229, tanker for Atlantic Refining Co. 543′10″ x 70′ x 40′; 11,600 gross tons; turbo-electric; 5000 shp; 13 knots. Launching date, August 4, 1941. Delivery date, October, 1941.

Hull No. 230, tanker for Atlantic Refining Co. 474′ x 65′ x 37′; 8000 gross tons; turbo-electric; 5000 shp; 14½ knots. Launching date, December 6, 1941. Delivery date, 1942.

Hulls Nos. 231-232, two tankers for Keystone Tankship Corp. 520′ x 68′ x 37′; 10,600 gross tons; turbine; 12,000 shp; 16½ knots. Delivery date, 1942.

Hulls Nos. 233 and 240, two tankers for Gulf Oil Corp. 485′ x 68′ x 36′; turbine propelled; 14½ knots. Delivery dates, December, 1942, and March, 1943.

Hull No. 234, tanker for Sun Oil Co. 547′3″ x 70′ x 40′; 11,400 gross tons; diesel propelled; 7500 shp; 15 knots. Delivery date, 1942.

Hulls Nos. 235 and 237, two tankers for Standard Oil Co. of N. J. 547′3″ x 70′ x 40′; 11,400 gross tons; turbine; 7500 shp; 15 knots. Delivery date, 1942.

Hull No. 236, tanker for Atlantic Refining Co. 543′10″ x 70′ x 40′; 11,600 gross tons; turbo-electric; 5000 shp; 13 knots. Delivery date, 1942.

Hulls Nos. 238-239, two tankers for Standard Oil Co. of Calif. 521′ x 70′ x 40′; turbine propelled; 15½ knots. Delivery dates, January and March, 1943.

TAMPA SHIPBUILDING CO.
Tampa, Fla.

New Construction:

Hulls Nos. 37-40, four C-2 type cargo vessels for U. S. Maritime Commission. 459′ x 63′ x 31′6″; 9291 dwt tons.

TODD-BATH SHIPBUILDING CORP.
Bath, Maine

New Construction:

Thirty cargo vessels for British Purchasing Commission. Cost $50,000,000.

* * *

NEW U. S. FISHERIES BOAT

Built in Newport News, Va., in 1930 and shipped to Seattle aboard the U. S. Navy supply ship Vega, the new fisheries patrol vessel **Pelican** arrived on Puget Sound April 10th. She was unloaded over the side of the larger vessel at the Puget Sound Navy Yard and transferred to the Bureau of Fisheries Terminals at Lake Union. She is a 72-footer with diesel engines, a sister ship of the Teal, already stationed at Seattle, and will operate in Alaska patrol service.

Heroism at Sea

A Modern Saga of Salvage

A modern saga of the sea featured by gallant heroism on the part of officers and crew members of the British motor tanker San Demetrio was brought to light in January of this year during salvage hearings in the English Courts. The action was on behalf of Arthur G. Hawkins, age 26, Second Officer of the San Demetrio, fourteen other members of the crew, and the personal representatives of John Boyle, an oiler, who claimed salvage remuneration for services rendered to the vessel, her cargo and freight, after the ship had been attacked on the afternoon of November 5, 1940, by the armed raider which sank the escorting auxiliary cruiser Jervis Bay.

The story brought out that the San Demetrio, a vessel of 12,132 deadweight tons, 460 feet in length and having a cargo-carrying capacity of 104,086 barrels (42s), while fully loaded, was damaged severely, and the Captain gave the order to abandon ship. The convoy in which the San Demetrio was one had previously been ordered to scatter.

In the Boats

A further unfolding of these remarkable events disclosed that:

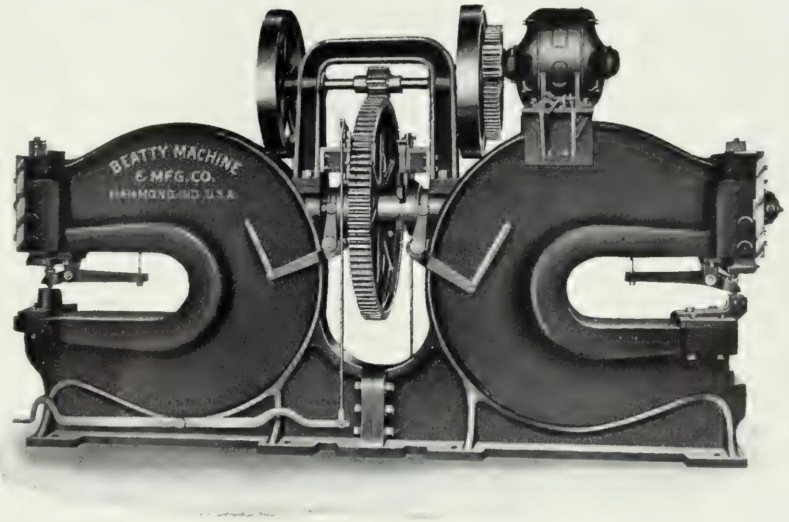
The tanker's complement left in three boats, one of which was commanded by the plaintiff, Mr. Hawkins, and was manned by the other plaintiffs. The boats dropped astern of the ship, which was shortly afterward seen to be struck by a heavy salvo and to burst into flames. On the following morning, November 6, in strong winds and heavy seas, the boats became separated and nothing further was seen by the plaintiffs of the other two boats. The lifeboat was kept afloat with considerable difficulty and in the early afternoon the tanker was again sighted, still on fire and surrounded by burning oil.

Re-Manning the Ship

At daybreak on November 7, the weather having moderated, the plaintiffs managed to get aboard the ship, where fire was still burning fiercely aft and the ship was glowing hot amidships. The bridge and its surrounding structure had been destroyed; compasses, steering gear and wireless had carried away, and only four spokes of the after steering wheel remained. After fighting the fire all during the night of November 7 to 8, the plaintiffs extinguished the flames and on the

(Page 116, please)

BEATTY Modernized
POWER PUNCHES and SHEARS



The No. 6 Double End Punch. Beatty punching machines have various size throat depths in both single and double ends.

for the Immediate Need of Coast Shipyards

Beatty Products are now being made available for Pacific Coast yards.

To meet your urgent requirements, we offer a complete line of punching and shearing equipment with superior construction advantages which will satisfy the most exacting buyer who requires machines that will stand up for years with minimum attention.

BEATTY EQUIPMENT eliminates unnecessary handling through combination set ups, and large die space, thereby increasing production and reducing costs.

Let Beatty Solve Your Problems

Punching & Shearing Machinery

Copers
Presses
Dies

Beatty

Bulldozers
Portable
Cranes

BEATTY MACHINE & MFG. CO.
HAMMOND, INDIANA

S. S. Robin Locksley

(Continued from page 61)

separate CO-2 system protects the emergency generator room. The fuel oil tanks are fitted with a steam smothering system.

Life Saving Equipment

Two 28-ft. long lifeboats, of 60-person capacity each, were furnished by the Landley Company, who also furnished the Steward Davits and Steward boat chocks. Two hand operated boat winches are provided. In addition to the lifeboats there is a 20-person Balsa float manufactured by the Atlantic and Pacific Manufacturing Corporation. Life preservers were furnished by the Sculler Safety Corporation.

Ventilation

Mechanical ventilation is provided for practically every space on the ship. All fans were supplied by the Ilg Electric Ventilating Co.

In all accommodations, galley and pantries, both supply and exhaust systems are used, with the exhaust having 75 per cent of the capacity of the supply. Changes of air effected: every 4½ minutes in accommodation spaces, every 5 minutes in officers' and crews' quarters; and every 2-3 minutes in galley and service pantries. Aerofin non-freeze heating coils are used and American Air Filter Company's washable type filters.

Aerofin non-freeze preheating coils and Aerofin flex tube reheater coils are used in conjunction with a Minneapolis-Honeywell pneumatic thermostatic system of control to keep accommodations at an even temperature of 70° F. in daytime, 60° F. at night. The machinery space is provided with 36,000 cfm ventilating air, making a complete change every 1.4 minutes for the 49,425 cu. ft. of net volume. This air is supplied by three Ilg fans of 13,000 cfm capacity each. The 3000 cfm spare capacity furnishes 2,000 cu. ft. to the Cargocaire equipment and 1000 cfm to the cargo refrigerated space.

Cargocaire System

The holds of the vessel are provided with an unusual ventilating system. All cargo spaces, except the refrigerated cargo storage spaces and ship stores, are provided with Cargocaire Ventilating, furnished by the Cargocaire Engineering Corp. of 15 Park Row, New York. 2,000 cfm is supplied from the forward engine room supply fan to the Cargocaire room, and is drawn through sea water cooling coils and dried by passing through beds of silica gel. The treated air is then distributed to the various holds. At certain intervals, depending upon the humidity of the atmospheric air, the silica gel becomes loaded with moisture and must be activated for further service. This is quickly accomplished by blowing heated air, furnished by heating coils, through the absorber beds to dry out the silica gel. To maintain a continuous flow of treated air to the holds, duplicate absorbent beds are installed and interconnected with four-way valves; thus, while one bed is drying air, the other is being activated. This de-humidifying unit has a capacity of 2,000 cfm and is located just forward of the boiler room at the operating platform level, with a 12″ supply pipe extending under the Shelter Deck to each Hold supply fan.

The ventilating and recirculating system of the cargo holds is arranged for either (1) ventilating with outside air, or (2) vigorously recirculating the inside air, each hold being an independent unit in this respect. Dry air from the Cargocaire unit is mixed with the recirculating streams to displace the moist air in the holds. This system reduces the dewpoint of air in the ship's holds by de-humidification to a point at which ship sweat and cargo sweat cannot occur. The installation consists of duplicate duct systems, one supply and one exhaust, on the forward and after bulkheads of each hold. Each has a single mushroom ventilator above a deckhouse, dampers, an axial-flow fan, a downcomer from the fan, and thwartship ducts at the top of each compartment to lead the air past the heavy girders, which would otherwise stop air flow when cargo is tightly stowed.

The condition of the air in each individual hold is at all times accurately known by the ship's personnel from continuous seven-day records. A recorder cabinet is located in a deckhouse at the exhaust end of each hold. It is connected by sampling tubes to each deck level. A similar cabinet in the chart-house records conditions of atmosphere surrounding the ship. By referring this information to a Cargocaire Dewpoint Chart, the officer in charge of conditioning cargo can judge the required operation of Cargocaire equipment and act accordingly.

Staterooms on Robin Locksley are kept automatically at the best temperature for comfort

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SPHERICAL COMPASS

HAS BEEN INSTALLED ON THE NEW

- U. S. Navy P. T. patrol torpedo boats.
- The Panama, Ancon and Cristobal.
- The 8 new American Export Line vessels built by Bethlehem Steel Co., Quincy, Mass.
- The new Robin Line ships.
- The new passenger vessels of the Mississippi S. S. Co.
- The new tankers for the Union Oil Co. of California.
- In general use in the U. S. Coast Guard; U. S. Lighthouse Service; U. S. Engineers; and in many vessels in the U. S. Navy.
- It is the type of compass specified in the U. S. Maritime Commission ships.

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• LOW TEMPERATURE . . .

It pays to have the protection of Mundet "Jointite" Corkboard and Moulded Cork Pipe Covering in storage terminals and refrigerated spaces aboard ship. This low temperature insulation gives dependable protection against heat infiltration. Economical, long-lasting, it is easily adaptable to individual requirements. Our engineering staff will be glad to help with specifications.

• HIGH TEMPERATURE . . .

We carry a full line of K & M asbestos and magnesia insulating products for marine requirements. K & M insulation, made by Keasbey & Mattison, assures highest efficiency and maximum power savings in high temperature operation. For full information on either low or high temperature insulation, write to the nearest Mundet office.

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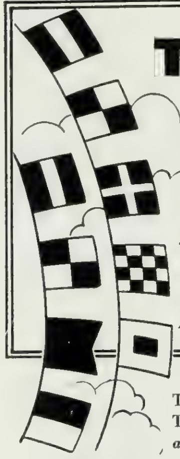

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welding fittings eliminate "many danger signals" in marine piping performance!

Today, more than ever, marine engineers insist on TUBE-TURNS seamless welding fittings—*because they positively answer these four all-important piping problems:*

1. FAST INSTALLATION. Tube-Turns are easier to align and faster to weld — *thus speeding up today's production schedules.*

2. GREATER SAFETY. Tube-Turns are made by an *exclusive process* that provides *greatest possible strength* — yet with needed *light weight.*

3. TROUBLE-FREE. Tube-Turns welded joints are *permanently leakproof*—which eliminates costly and dangerous delays for repairs.

4. REQUIRE LESS SPACE. Tube-Turn elbows and returns are ideal for crowded spaces and sharp angles, because they are the *only* fittings that can be cut to *any angle* and still retain uniform wall thickness.

TUBE-TURNS, Inc., Louisville, Ky., Pacific Coast Office: 210 W. 7th St., Los Angeles. Phone Van Dyke 4762

90° and 45° elbows, 180° returns, tees, reducers, heads, nipples, laterals and flanges in a full range of sizes. Send for copy of catalog now

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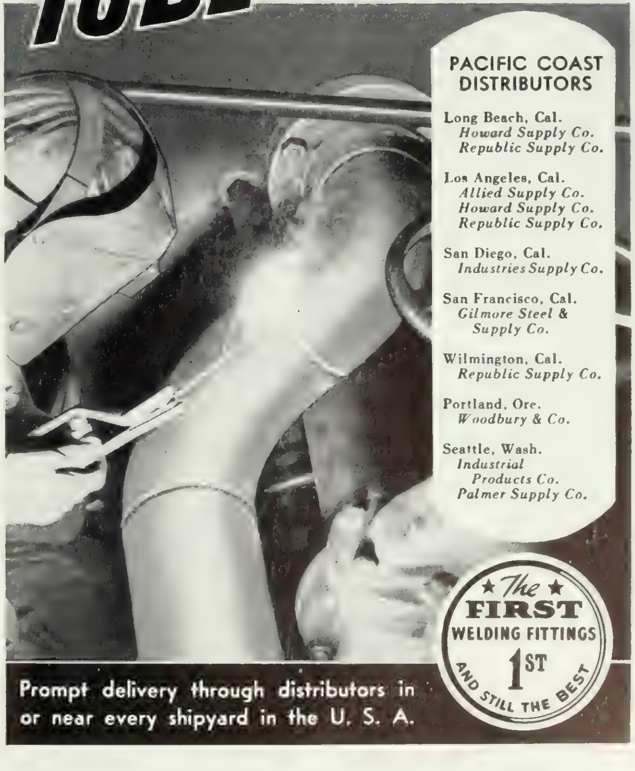

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Prompt delivery through distributors in or near every shipyard in the U. S. A.

On the Ways

(Continued from page 78)

SUN BUILDS BIG TANKER IN RECORD TIME

Built and outfitted in record time, the S. S. E. H. Blum, latest addition to The Atlantic Refining Company's growing fleet of oil tankers, left on her first voyage at 8 a.m., April 2, from the Sun Shipbuilding and Dry Dock Co. yard at Chester, Pa. She arrived Tuesday, April 8, at Harbor Island, Texas, to take on her first oil cargo.

This tanker, one of the largest all-welded ships in service on the seven seas, cleared from the Sun yards just one day less than six months after her keel was laid there last October 3. This is said to be a record for an all-welded ship of its size. The speed with which the big ship was built and outfitted reflects the way in which construction work in American shipyards has been speeded up by the national emergency.

Tanker E. H. Blum is 544 feet over all and has a cargo capacity of 154,000 barrels. Her 5,000-horsepower turbo-electric engines give her a sea speed of 13.25 knots. She will ply between Texas ports and Philadelphia with cargoes of crude oil for the Point Breeze refinery.

CONTRACTS LET FOR 200 EMERGENCY SHIPS

Contracts for all of the 200 standard design cargo vessels in the Maritime Commission's emergency shipbuilding program have been cleared with the Office for Production Management and signed, it was announced April 4 by the Commission.

The last contract to be cleared and signed is for 25 ships to be built by Delta Shipbuilding Co., Inc., on the facilities of the Louisiana Shipyards, Inc., at New Orleans, La. Delta Shipbuilding Co. is a Louisiana corporation and a subsidiary of American Shipbuilding Co., Cleveland, Ohio.

Under the terms of the contract, the company will produce the first ship within 389 days from the effective date, March 18, and the last of the 25 vessels is to be completed within 800 days.

The base construction cost of the 25 ships is to be $37,500,000. The contractor will receive a fee of $110,000 a vessel, which can be reduced to $60,000 in event of late delivery or excessive costs or increased to $140,000 per ship for expedited delivery and reduced costs.

Previous contracts for 175 of the emergency program ships were awarded to: Oregon Shipbuilding Co., Portland, Oregon, 31 ships; California Shipbuilding Co., Los Angeles, 31; Houston Shipbuilding Co., Houston, Texas, 25; Alabama Drydock and Shipbuilding Co., Mobile, Alabama, 13; North Carolina Shipbuilding Co., Wilmington, N. C., 25; Bethlehem-Fairfield Shipyard, Inc., Baltimore, Maryland, 50.

The Commission completed award of contracts on February 14 for the shipyard facilities for the construction of the 200 ships, and progress on the yards indicates keels can be laid in all of them within the next 45 to 60 days.

ZONE STANDARDS FOR PACIFIC COAST SHIPBUILDING

Formal approval of zone standards for the entire Pacific Coast shipbuilding industry, designed to stabilize labor relations and secure maximum construction of ships for the duration of the defense emergency, was announced April 11 by the U. S. Maritime Commission and by **Sidney Hillman,** Associate Director-General of the Office of Production Management.

Shipyard employers and labor organizations of the Pacific Coast met in San Francisco February 3, as the Pacific Coast Stabilization Conference. This Conference recessed from February 13 to March 10 and completed its tentative agreement April 2. In addition to government approval, that of the various firms and labor organizations involved is now being obtained preparatory to the final meeting of the Conference on April 21.

Following are the zone standards agreed upon:

Basic wage rates for standard skilled mechanics, for the period of the defense emergency. Existing wages above the standard are not to be reduced and that higher wages may be paid to premium men.

A standard schedule of hours for shift work, with 10 per cent added wage for the second shift and 15 per cent added wage for the third shift.

No lockouts on the part of the employer nor suspension of work on the part of the employees. This agreement is a guaranty that there will be neither strikes nor lockouts and no limit on, or curtailment of production.

All grievances or complaints shall be "promptly settled" between representatives of the employer and employees; where necessary, the services of the United States Conciliation Service shall be "speedily secured"; should no agreement be reached, the dispute shall be submitted to arbitration machinery to be established by supplemental agreements, and to be binding upon all parties.

While this agreement is expressly made for the emergency period or, should that period terminate earlier, for a minimum of two years, it is contemplated that it shall continue in force thereafter, unless either management or labor gives a 30-day notice of a desired change. The wage scale may be reviewed on the demand of labor at the end of one year and on the demand of either party at each six-month period thereafter. A cost-of-living basis for wage revisions is provided.

—BAREBOAT CHARTERS

Acceptance of bids of the Moore-McCormack Lines, Inc., New York City, for bareboat charter of the cargo steamers Deer Lodge and West Keene for the period of one year was authorized by the Maritime Commission April 11th. The charter price for each of the ships was $16,225 per month.

The award was made on the basis of preference stated in the invitation for bids, to be given to the bidder who would place the vessels on trade routes deemed by the Commission to be the most essential at the present time.

Further preference was given the successful bidder because it has, within the last six or eight months, turned over to the Government five new vessels for defense purposes.

The Moore-McCormack Lines, Inc., specified that the two ships would be used in South American East Coast trade. Other bids were as follows:

Isbrandtsen Steamship Co., Inc., $24,500 each ship; Polarus Steamship Co., Inc., $19,600 each ship; Wessel, Duval & Co., Inc., Deer Lodge, $17,132, West Keene $17,182.

Are your vessels affected by these deck-glue problems —Does hot weather cause softening and running over the seams? Does cold weather cause a brittle dryness? If you are bothered with these or other deck-repair problems, write for FREE data on how to solve them economically, efficiently.

Jeffery's Ship Glue conforms to all temperature changes and is consistently strong, long-lived and elastic, under all conditions.

L.W. Ferdinand & Co., Inc.
599 Albany Street *- Est. 1873 -* Boston, Mass.

SHIPPERS: Swift, efficient freight service, modern refrigeration facilities via the *Lurline* and *Matsonia* to Hawaii; the *Mariposa* and *Monterey* to New Zealand and Australia by way of Samoa and Fiji. Regular, frequent freighter sailings from Pacific Coast ports.

• Hawaii's yesterdays are alive today! They live in lovely flower rituals. They delight the ear in Island music. Island dances dramatize them. They return with Waikiki's racing outriggers, re-enacting the sea-saga of Polynesian Vikings, who sailed into the sunrise and found Hawaii, a home so beautiful it left no further will to wander.

California to Honolulu *(one way)*
FIRST CLASS *from* $125 • CABIN CLASS *from* $85

MATSON SOUTH PACIFIC SAILINGS every 4 weeks to New Zealand and Australia . . . *personally-escorted* Cruises, 17,000 miles; 48 days . . . 12 exceptional shore excursions. All-inclusive-cost, First Class, *from* $775.

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HOT off the PRESS

The Catalogs of Today Become the Technical Handbooks of Tomorrow

Mechanize Your Drawing Board, a new four-page folder, describing their recently developed, low-priced drafting machine, has just been issued by the Drafto Company, Cochranton, Pa.

This folder contains information as to construction, operation details and prices of the "Master-Drafto" Model No. 60 drafting machine. The machine, for center mounting on a drawing board or table, takes a maximum size drawing sheet 24 x 36 inches. It features scale blades designed to hold any standard size scale, and the protractor device, which has a convenient latching spring for locking the scales at the more commonly used angles, can be set for ½ degree readings.

◆

Synthetic Rubber Properties. Detailed description of the properties of Ameripol, its synthetic rubber announced last year, as they relate to mechanical rubber goods products is given in a bulletin just issued by The B. F. Goodrich Company, Akron, Ohio.

Crude Ameripol rubber is very similar in appearance to natural crude rubber, the bulletin says, and like natural rubber, it can be compounded to give a wide range of properties in the finished product. It can be tubed, calendered, frictioned, spread, milled and vulcanized just like natural rubber.

Resistance to mineral, animal and vegetable oils and fats; to the oxidizing influence of the metallic soaps used as driers in paints and inks; to heat, and to abrasion, particularly in the presence of oil, are among the most valuable fundamental properties of the synthetic product.

Ameripol compounds can be made in the same hardness range as those of natural rubber, and elongation is also about the same. Tensile strength can be varied by the materials used in compounding.

◆

Cutting Tools and Blanks, a new 32-page catalog, No. 41, just issued by McKenna Metals Co., Latrobe, Pa. This booklet lists specifications and prices for five styles of blanks, twenty-eight standard tools and several semi-standard tools; as well as for lathe and grinder centers supplied with Kennametal nibs.

Prices of blanks and of semi-finished tools have been listed, so that the user can quickly find the price of any desired tool or blank without consulting a separate price list. List prices for blank weights from 1.00 to 1000.00 grams are tabulated.

Illustrated and described are new styles of facing tools for turret lathes, new styles of box turning tools, tools for shell turning in automatic lathes and a series of boring tools having rake angles to adjust for radial rake angles in small and medium holes.

◆

Portable Power Tools, a new catalogue describing the complete line of Thor mining and contractors air-powered tools has just been issued by the Independent Pneumatic Tool Company. One of the outstanding books of its kind, it contains complete descriptions and specifications of all Thor rock drills, paving breakers, clay and trench diggers, sump pumps, saws and associated air tools. In addition, it graphically depicts specific aplications and uses for all the various tools.

Profusely illustrated and attractively printed in two colors, the new catalog also gives detailed information on accessories and equipment for use with the tools and points out important construction features.

◆

Operation of Centrifugal Boiler-Feed Pumps is the title of a winning paper in an engineering essay contest recently conducted by the Hydraulic Institute. This paper was submitted by Hans Gartmann, an engineer of the De Laval Steam Turbine Co., Trenton, N. J., and that company has reprinted it for general distribution. The author points out that two essentials of trouble-free operation are that there must be sufficient pressure on the suction of the pump to prevent vapor formation and that sufficient flow must be maintained through the pump to prevent overheating. Charts and data are presented from which the required suction head may be determined and descriptions given of methods for controlling heating at reduced deliveries by means of a manually or automatically controlled by-pass.

◆

Portable Substations, a new 8-page bulletin (B-2281) announced by Westinghouse Electric and Manufacturing Company. These portable substations are available in all voltage ratings up to 69 kv and in capacities up to 4500 kva.

Packaged power for present-day requirements is described. Typical trailer mounted substations are illustrated with arrows pointing to essential parts. Engineering details such as core and coils, heat exchanges, and automatic protection are explained. Application features are listed.

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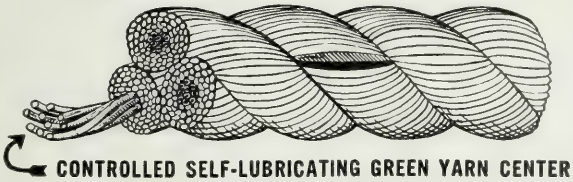
THE SELF-LUBRICATING PURE MANILA ROPE



CONTROLLED SELF-LUBRICATING GREEN YARN CENTER

IDENTIFIED BY THE BLUE AND YELLOW COLORED YARN TRADEMARK

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It is common sense that where there are many fibres chaffing against each other friction will be generated unless a proper lubricant is applied at the right spot.

The right spot in a rope is the center yarns—it is at this point where Fitler Patented feature of lubrication permits the center yarns to glide easily upon each other. This exclusive feature with Fitler Lubricore Rope means much in reducing water absorption, thus allowing center yarns to dry out more quickly.

BE THRIFTY—Insist on the Fitler Brand. Easily identified by the Blue & Yellow Trademark.

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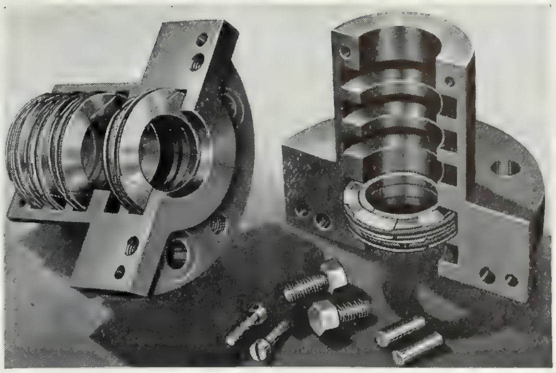

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If you'd like complete information about this more durable, more economical finish, write to: E. I. du Pont de Nemours & Co. (Inc.), 235 Second Street, San Francisco; 2419 South Grand Ave., Los Angeles; 525 Boren Ave. North, Seattle.

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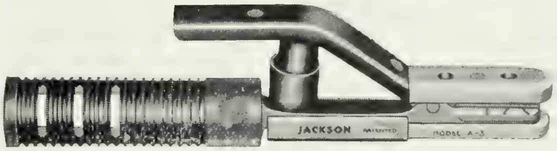

JACKSON'S A-3 . . .

In shipbuilding operations where it's necessary to work with high heats, this Jackson heavy duty holder (A-3) really has what it takes. Rated 500 Amps., it's fully insulated—*safe*. Scientifically ventilated at all vital points, *it works cool*. Cable connection is *dependable*. Replaceable jaw plates are of Mallory 3 Metal; deep slotted, they firmly grip $\frac{1}{16}''$ to $\frac{3}{8}''$ rods at correct angle. Quick availability of replaceable parts assures ***long life at low cost.*** Also supplied in 300 Amp. (A-2).

Contact your dealer or write to us. Our new Holder Folder illustrates and describes our complete line of insulated and non-insulated models. Ask for it.

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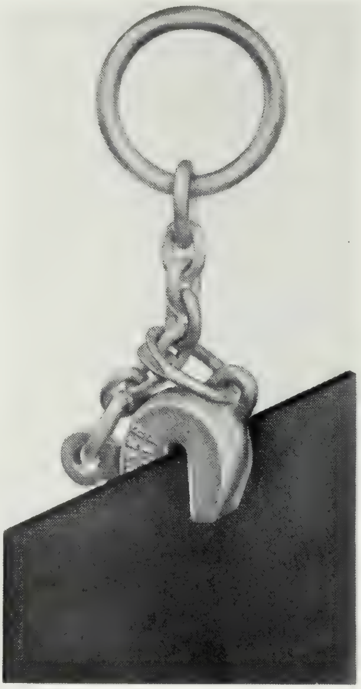
Recent Development in Ship, Yard and Dock Equipment

—A NEW CYLINDER TRUCK

A new hand truck designed to carry an oxygen cylinder, an acetylene cylinder, and a complete welding and cutting outfit, has just been announced by The Linde Air Products Company, a unit of Union Carbide and Carbon Corporation. This new truck —known as the Oxweld T-7 Two-Wheel Welding Truck—is light in weight, well balanced, and has 14-in. wheels equipped with semi-pneumatic rubber tires. The T-7 weighs considerably less than the former all steel-wheeled trucks which it replaces.

These features make the truck exceptionally easy to maneuver. It is easier to handle over rough places than trucks with even larger-diameter wheels. The new design results in a 4½-in. reduction in overall width of the truck, permitting passage through narrower openings. As an added feature, the size of the removable metal tool box, for extra blowpipes, tips, goggles and wrenches, has been increased.

Improved hand truck for welding gas cylinders



Safety lifting clamp

IMPROVED SAFETY LIFTING CLAMP

An improved style of safety lifting clamp, equipped with a replaceable, grooved, hardened steel jaw liner, is announced by the Never-Slip Safety Clamp Company.

These clamps, made for either horizontal or vertical lifting of steel plates, sheets or sections, are available in ten styles for handling material weighing up to twelve tons, and from 1/8″ to 6″ in thickness.

The replaceable plate lines the face of the jaw and greatly extends the life of the clamp as well as contributing to its lifting and holding qualities. The plate is readily replaceable in the event of wear.

NEW TRI-CLAD CAPACITOR MOTOR

As an extension of its recently announced line of new polyphase induction motors, General Electric now offers a new Tri-Clad capacitor motor designed to meet a large number of varied industrial applications. Like the Polyphase Tri-Clad motor, this capacitor motor features modern appearance, and better mechanical and electrical protection as well as protection against operating wear and tear.

The new capacitor motor may be obtained with either ball bearing or sleeve-bearing construction, and is available in two types, Type KC and Type KCJ. The Type KC is designed particularly for applications requiring moderate starting torques such as fans, blowers, and centrifugal pumps. The Type KCJ is designed for compressors, loaded conveyors, reciprocating pumps and any other applications requiring high starting torque. The capacitors are mounted inside the end shield on the normal-torque motor, while on the high-starting torque motor, 1½ hp and larger, the capacitors are mounted in a compact case on top of the motor frame.

In both of its forms, the capacitor motor incorporates all of the protective features of the Tri-Clad line: (1) complete mechanical protection through the use of a cast-iron frame, (2) electric protection made possible by the use of Formex wire in the magnet coils, and (3) improved bearing design and lubricating arrangements. It also utilizes the cast-aluminum rotor and double-end ventilation. In addition, it offers many convenience features.

The transfer switch is a simple sturdy device which transfers the motor from the starting to running connection. It consists of a centrifugal mechanism mounted on the rotor shaft, and a stationary switch located in the end shield. As the motor approaches full speed, centrifugal force moves the collar of the rotating mechanism away from the switch by snap action, thus causing the switch to open.

A new pressed-steel conduit box provides unusually large working space and simplifies installation.

Clearly marked terminals permanently identify the leads. A graphic, easy-to-read connection plate of stainless steel shows external connections.

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Reciprocating and rotary pumps for marine, industrial and refinery service.

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FEED WATER HEATER & EVAPORATOR COILS
Carried in San Francisco Stock.

THE MAXIM SILENCER COMPANY
All types of silencers and spark arresters for gasoline and diesel engines, and air compressors.

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Marine Bottom Paints.

KOPPERS CO.—AMERICAN HAMMERED PISTON RING DIVISION
Piston rings for gasoline, diesel and steam engines, air compressors. Diameters from 1 inch to 120 inches—separately cast.

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Feed Water Filters, Grease Extractors and Strainers.

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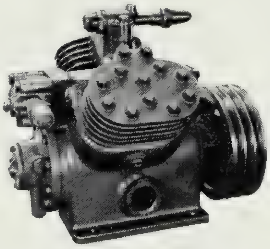
CARRIER'S Marine experience counts because it is backed by over 4,000 refrigeration and air conditioning installations on vessels of all tonnages. On the Pacific Coast, call upon the nearest one of our three fully qualified Representatives listed below.



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Complete range of sizes, choice of refrigerants, built to marine specifications.

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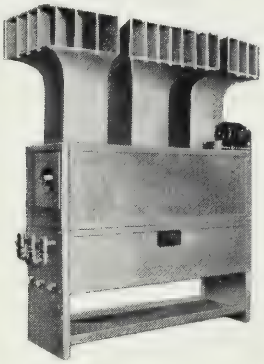

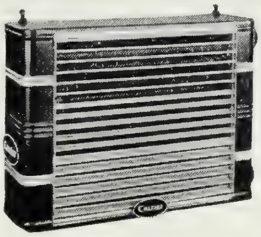

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A NEW HIGH WATTAGE LAMP

A new type high-wattage lamp, just introduced, will enable operators of ships, docks, warehouses and shipyards to increase their illumination up to 250 per cent or more without changing fixtures. The use of a hard glass bulb has made it possible to reduce the size of a 500-watt lamp to that of an ordinary 200-watt lamp, and also permits the lamp to withstand thermal shocks when used outdoors. The new lamp was originally designed for use in explosion-proof fixtures.

Former attempts to reduce the size of high wattage lamps resulted in melting of the bulb or collapse of the filament support, due to the intense heat developed. In place of the large "mogul screw" base and heavy fixture necessary to support the weight of an ordinary 500-watt lamp, the new lamp made by the Radiant Lamp Corp., can use a "medium screw" base like those in ordinary household fixtures. Unlike conventional lamps, the hard glass Radiant Lamp is said to withstand the sudden shocks of rain or sleet without cracking. Other size industrial lamps up to 10,000 watts are now being made to meet special requirements in various industries.

* * *

AUTOMATIC CHECKUP OF INDUSTRIAL SOLUTIONS

A simple electronic instrument now available checks the concentration of solutions and steam condensate at the mere twist of a knob. Furthermore, it warns of any excess, or automatically sets the corrective means to work. Known as the Solu-Bridge Controller, offered by Industrial Instruments, Inc., this instrument combines the analytical function of the well-known Solu-Bridge, with a sensitive vacuum-tube relay whereby to control an external circuit containing a suitable alarm or an electromagnetic valve or other corrective means that brings the solution or condensate back to normal.

The Solu-Bridge Controller is based on the conductivity of the solution or condensate being checked. A cell placed in the liquid makes electrical contact with a sample of definite cross section and length. The electrical conductivity of the sample is measured by a simple, foolproof, stable Wheatstone bridge utilizing the familiar "magic eye" as the balance indicator.

Solu bridge controller

The instrument, of remarkably compact dimensions, can be mounted at any convenient location and remotely connected with the one or more conductivity cells. The front panel of steel cabinet features a small dial which is set for the approximate temperature of the solution or condensate, while a large main dial is rotated for the analytical and controlling functions. Observing the magic eye through the hooded peephole, when the indicator presents the widest angle of dark segment, the reading in percentage, parts per million or other desired terms for which the instrument is calibrated, is taken directly off the main dial. The "magic eye" indication is sharp, positive, unmistakable for accurate readings. This is the analytical function of the instrument.

Now if the main dial knob is set at any reading, automatically the relay of the instrument will be actuated when that particular value is attained. The instrument may be arranged to close or to open the relay contacts, as may be desired. The sensitive relay is positively actuated by vacuum-tube circuits, and serves to handle an external current up to 2 amperes at 110 volts. This external current may be used for an alarm such as a gong or bell, electric horn or whistle, or flashing lights. Also, it may be utilized to actuate an electromagnetic valve or other corrective mechanism to admit water or chemicals, or otherwise compensate for and bring the solution or condensate back within set limits.

A typical application is the checking of steam condensate for excessive carry-over of salts which might cause damage to turbine blades and other equipment. In such usage the instrument checks a condensate sample supplied by a small condenser connecting with the boiler header. When the condensate checks excessive carry-over, a warning is given the boiler-room crew, or automatic blow-down or other corrective measures effected.

* * *

A NEW INDUSTRIAL PUMP

A new rotary pump for general industrial use has just been put on the market by the Blackmer Pump Company, Grand Rapids, Michigan, according to an announcement by J. B. Trotman, general sales manager.

While employing the basic Blackmer "Bucket" Design and operating on exactly the same principle that is used in all Blackmer "Bucket" Design pumps, certain refinements have stepped up the efficiency of this new pump, made it more quiet in operation and increased the life of the buckets from two to three times.

Streamlining the inlet chamber of the pump enables the new unit to handle liquids of higher viscosity at the rated operating speed. The new pump has been tested on a wide variety of liquids ranging in viscosity from naphtha to blackstrap molasses and has performed quite satisfactorily.

These pumps will be furnished without removable liner for handling clean liquids with lubricating properties, or with removable liners for handling corrosives and mildly abrasive liquids. Replacement of the liner and buckets restores the pump to its original efficiency. Standard units are furnished as single or twin pumps with single reduction gear drive, or as single pump direct-connected to gear-head motor, or for flat belt drive.

The high lift, non-chattering, adjustable relief valves will handle the full capacity of the pump without shock or end thrust on the working parts.

Strainers of basket or "T" type are available as optional equipment. Pipe connections are 2 inches, both intake and outlet, tapped.

The rated capacity is 50 gpm, at 460 rpm. The rated maximum pressures for lubricating liquids—110 lbs psi and for non-lubricating liquids—75 lbs psi. Pumps for higher pressure are also available.

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—AND HER HULL IS DRY AS TOAST

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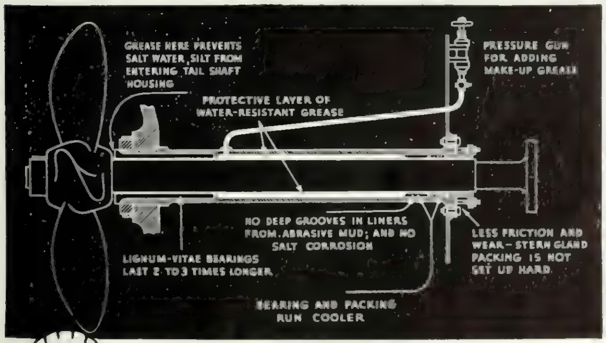
There's no more corrosion in the shaft alley well. Lignum vitae bushings last up to 3 times as long and the hull is kept *dry*.

These advantages of Shell Stern Tube Lubrication are enjoyed today on more than 700 ships and boats on the West Coast.

For full facts, phone nearest Shell office or write to Industrial Lubricants Division, Shell Building, San Francisco, California.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PROTECTIVE LAYER OF WATER-RESISTANT GREASE
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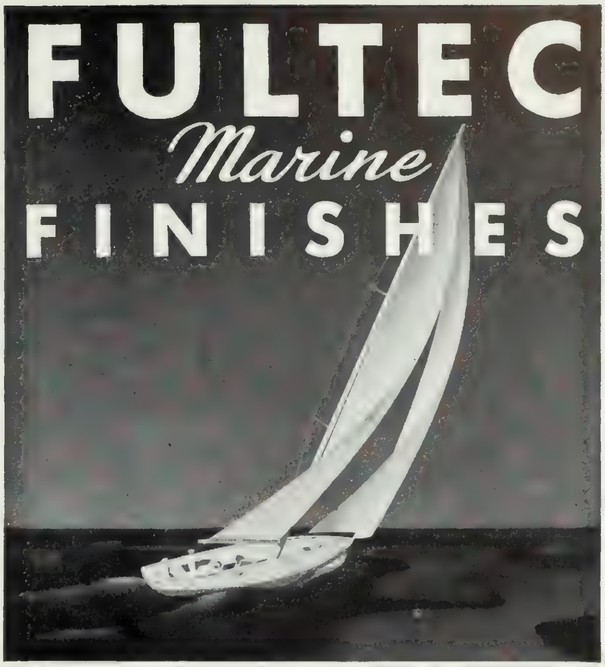
LESS FRICTION AND WEAR—STERN GLAND PACKING IS NOT SET UP HARD
LIGNUM-VITAE BEARINGS LAST 2 TO 3 TIMES LONGER
BEARING AND PACKING RUN COOLER

SHELL STERN TUBE LUBRICATION



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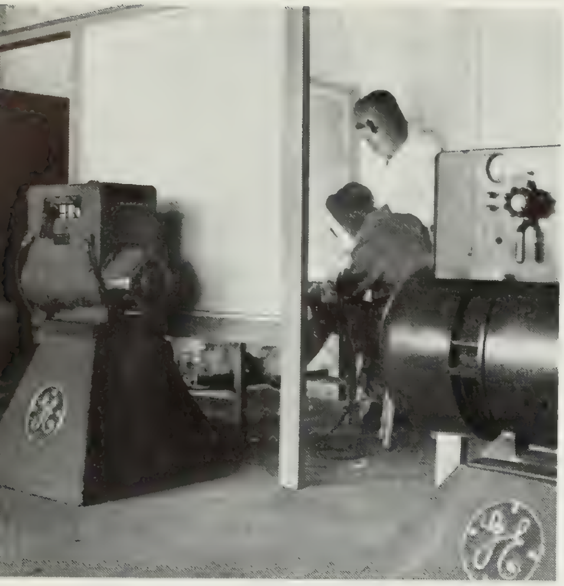

A corner of the Southwest Welding School showing instructor and pupil at work

NEW PACIFIC COAST WELDERS' SCHOOL

Anticipating a substantial need for trained welding operators to meet the needs of the West Coast defense projects, particularly shipbuilding, the Southwest Welding School of Huntington Park, Calif. (near Los Angeles) recently announced its modern facilities for training welding operators.

The new school has large, spacious quarters with individual welding booths and the latest in welding equipment. Expert supervision and individual attention are being given students by the new organization, which is headed up by O. T. Quinn, who is also chief instructor.

Included in the school's equipment is a tensile- and bend-testing machine. Five new 300-ampere and five 200-ampere General Electric welders have also been installed through the Victor Equipment Company, G-E's welding distributor in this territory. All seven welders are cradled on welded bases, and even the monograms on the bases are of weld metal.

This school is now operating six 3-hour shifts a day, starting at 5 a.m.

◆

LUBRICATED H. P. SPIRAL PACKING

Green-Tweed & Company announce that a high-pressure spiral packing is now available with the outer layer impregnated with lubricant forced into the packing by a special hot pressure process. The lubricant used is genuine Palmetto graphite grease, which has proven outstandingly successful in the well-known Palmetto braided packing.

Palmetto High - Pressure Spiral Packing is made of closely woven asbestos cloth with center block laid up against a flat strip of heat-resisting, resilient red rubber. The cover or wear face is firmly bonded to the center to make a strong square cornered packing. The packing is spiraled on a mandrel and vulcanized so that it retains its shape, and the exclusive lubricating process is then applied.

The resulting construction combines ruggedness and resilience, which withstands misalignments and impact shocks, together with effective and lasting lubrication, which reduces wear on the rod or shaft and prolongs the life of the packing.

This Spiral Asbestos Packing is specially adapted for reciprocating rods and plungers of steam engines and pumps, air and gas compressors and various special machinery. The packing is regularly furnished in standard 12½-foot spirals.

◆

TEN YEAR TEST ON OIL HOSE

Results of an interesting test on oil suction and discharge hose with built-in nipples lasting for 10 years are reported by The B. F. Goodrich Company.

A decade ago, Goodrich engineers decided that this type of hose was to find the greatest favor in handling oil on the docks. Lengths of three different constructions were manufactured to determine the best construction for holding the nipples in place.

Burst tests were made on samples, as well as prolonged leakage tests. Samples were then filled with kerosene and placed on the roof of one of the company's factory buildings in Akron, Ohio.

Pressure of 100 pounds per square inch was maintained on each sample by fitting the hose with air connections and supplying a reservoir between the air line and the hose. Thus, when the factory's air pressure went up and down, the pressure of the oil was varied.

After 10 years exposure under these pressures, each of the samples was submitted to pressure tests with the following results:

Length No. 1: Kept at 150 pounds for 10 minutes, 250 pounds for 10 minutes, 400 pounds for three minutes, pressure increased until hose burst at 470 pounds.

Length No. 2: 150 pounds for 10 minutes, 250 pounds for 10 minutes, hose burst at 400 pounds.

Length No. 3: 150 pounds for 10 minutes, 250 pounds for 10 minutes, hose burst at 420 pounds.

In each case the hose burst near the middle of the section with no leak or seepage whatever at the nipples.

Since these hose samples were constructed a decade ago, a number of improvements have been made, including the introduction of synthetic coating in the first center to prevent penetration of the carcass and rusting of the wire which causes "flagging."

Tests of similar nature on present day hose are yielding even better results, B. F. Goodrich engineers report.

◆

ADDITIONS TO COAST GUARD ACADEMY

Award of a contract for the construction of additions to the cadet barracks and library at the Coast Guard Academy, at New London, Connecticut, has been made to Alan Lawrence Co., Inc., of New York, New York, in the amount of $257,175, according to an announcement of Rear Admiral R. R. Waesche, Commandant, U. S. Coast Guard. Under the terms of this contract, all work must be completed within 190 days, but because of the usual resumption of academic work in the early fall, certain parts of the construction is to be completed by September 1.

The new construction will provide much needed additional space for the unusually large class which entered the Academy last year and for the new class which will enter during the next few weeks, which also is expected to be well above the average in size. Accommodations for 104 additional cadets will be provided as the result of the present construction, and the Academy's library will also gain space for the housing of an additional 100,-000 volumes. Academy buildings have been designed in the Colonial style of architecture, and this will be followed in the new work. The additions will preserve the unity of the present buildings. New construction will be of brick with slate roofs.

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When Clear—Burn blue light or give four flashes on Morse lamp.
Daylight—Set Jack at foremast.

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New Shipbuilding Plants?

Why? Where? By Whom?

Chairman Emory S. Land of the United States Maritime Commission has made the following statement on Commission policy:

Obviously the Government will need more ships than it is now building, and our production of ships for delivery in 1941 and 1942 *must* be increased as dictated by Congress under the Lease-Lend Bill provisions. However, there has been so much misinformation with regard to shipbuilding, emergency and otherwise, that is necessary to outline the general policies of the Commission with regard to the subject:

(a) Any individual or group may build a shipbuilding plant any place he or they choose, if they are willing to finance the project with their own funds.

This, of course, is a self-evident fact but does not seem to be understood.

(b) If shipbuilding plants are to be built with Government funds, there are certain general specifications which must be met before serious consideration can be given to the project.

(1) Geographical location — This means that the location selected should be one that will not interfere with present shipbuilding work or any other national defense activities. Such matters as housing, transportation, power and labor market are vital points to be considered in the location selected.

(2) Finance—There must be ample finances to carry on operations, to meet prospective payroll, to buy materials, etc.; to secure necessary bonding, both procurement and production, and in general to have sufficient financial backing to insure stability of the project irrespective of the fact that the Government may ultimately pay the bills. These financial requirements are essential in order to avoid contracting with personnel who fall under one of the two categories: (a) promoters; (b) people with their office in their hat.

(3) Shipbuilding brains—In a shipbuilding project it is not only essential to have a working nucleus of skilled and unskilled labor, but it is absolutely vital to have what is called "white collar" brains; this means executives managers, engineers, draftsmen, architects, masters, quartermen, leadingmen, snappers, etc. These "white collar" shipbuilding brains may only be 5% of the total employment roll, but they are the most important and the most vital in the project; and such brains cannot be satisfactorily trained but must have obtained their knowledge by experience.

The selection of a site must have the general approval of the Office of Production Management, the Navy Department, the National Resources Planning Board and the Maritime Commission. These are the Governmental bodies who have instructions to carry out the Administration policies.

In general, the policy of the Maritime Commission is to utilize shipbuilding plants (both old and new), extending their facilities as may be necessary. There are now 43 shipbuilding plants in the United States, and, in view of the tremendous shipbuilding burden already undertaken (primarily Navy), and in view of the tremendous dilution that has already taken place in shipbuilding labor, both skilled and unskilled, as well as still further dilution of shipbuiding brains, it is imperative not to further dilute but to utilize existing plants where extensions can be made much more satisfactorily and much more economically than by starting new plants.

PROPORTION OF THE WATER-BORNE FOREIGN COMMERCE OF THE UNITED STATES CARRIED BY AMERICAN AND FOREIGN FLAG VESSELS
(In thousands of Cargo Tons of 2,240 Pounds)
CALENDAR YEARS 1921 to 1939 INCLUSIVE
IMPORTS AND EXPORTS COMBINED

Year	Total Tons	AMERICAN		FOREIGN	
		Tons	Percentage	Tons	Percentage
1921	81,841	41,739	51	40,102	49
1922	87,473	44,611	51	42,862	49
1923	93,219	39,152	42	54,067	58
1924	93,160	40,990	44	52,170	56
1925	92,801	37,120	40	55,681	60
1926	112,826	38,227	34	74,599	66
1927	99,118	40,153	41	58,965	59
1928	106,224	43,475	41	62,749	59
1929	108,460	43,153	40	65,307	60
1930	97,294	39,737	41	57,557	59
1931	75,913	28,182	37	47,731	63
1932	60,555	21,471	35	39,084	65
1933	58,953	19,373	33	39,580	67
1934	67,635	22,202	33	45,433	67
1935	72,112	22,865	32	49,247	68
1936	78,110	21,813	28	56,297	72
1937	96,621	24,247	25	72,374	75
1938	88,430	22,436	25	65,994	75
1939	92,440	20,540	23	71,899	77

Notes: All figures subject to revision.
Column headings "American" and "Foreign" indicate flag of carrier vessels.

Courtesy—Division of Research, U. S. Maritime Commission.

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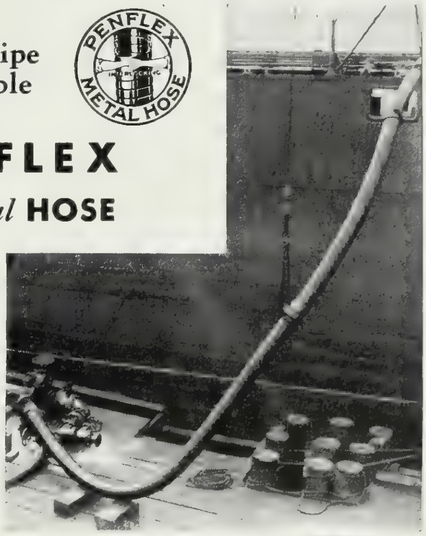

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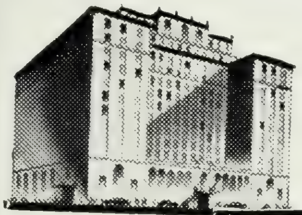

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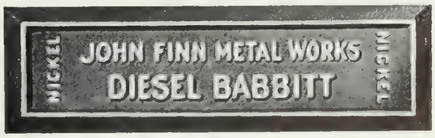

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Heroism at Sea

(*Continued from page 101*)

afternoon of November 8 a temporary steering platform was constructed, the main engines were started and the vessel headed for port. A British warship sighted the tanker on November 14, a party of officers and crew went aboard, and escorted by the war vessel the San Demetrio arrived in the Clyde on the night of November 16 with about 10,000 tons of cargo still aboard.

Counsel for the defendants, while admitting that in most salvage cases there were contentions and opposition, said this case was quite different and his task far happier. He declared he was there to support to the full the tributes to the conduct of the claimants, which had been made by the managing director of the firm which he (counsel) represented, and not to quarrel in any way with the evidence which had been given by the claimants.

The story revealed that when the convoy was attacked the Jervis Bay turned toward the raider, giving the other vessels a chance to escape, but the San Demetrio, having a full cargo, was an easy prey. She was hit repeatedly and when the plaintiffs reboarded her in mid-ocean, with only one dinghy left on board and in bad weather, with two of the boat's crew seriously injured, the condition of the tanker was pitiable.

Mr. Justice Langton, presiding in the case, stated, "I do not think that I am using language of exaggeration when I say that when the splendid story of the Jervis Bay comes to be written in full, the tale of courage, resource and skill with which the salving of the San Demetrio was accomplished will afford a fitting and not unworthy sequel to what has happily been called one of the great English stories of the sea."

American Crew Member Honored

His Lordship referred to a report by the managing director of the owners, one passage of which dealt with the stoical courage of John Boyle, and another with the part played by an American, Ross Preston, who joined the crew as a Nova Scotian because he wanted to reach Britain to join one of the fighting forces. He was simply magnificent, the report said, adding:

"No finer tribute can be paid to this man than the unanimous request made by all on board that the Red Ensign which the vessel was flying all through the action until she arrived in port should be presented to their American shipmate."

Fireroom Hero

Speaking of John Boyle, the oiler, who during two days of agony in the boat never complained and then carried on work in the engine room until too weak even to sit on a box in the stokehole, when he was moved to one of the few rooms not gutted and found dead in the morning, Mr. Justice Langton remarked, "In this unspectacular manner passed a hero."

The decision of the Court awarded the maximum allowable by law for such cases.

(Reprinted from "The Ships Bulletin.")

Deck Officers' Licenses for March

Name and Grade	Class	Condition
SAN PEDRO		
Lester L. Carroll, Master	SS, any GT	RG
John J. Abraham, 3rd Mate	SS, any GT	O
Edw. F. Donnelly, 3rd Mate	SS, any GT	O
SAN FRANCISCO		
William H. Aguilar, Master	SS & MS, any GT	RG
J. W. Lichtenstiger, Master	SS & MS, any GT	RG
Alfred H. Stephens, Master	SS & MS, any GT	RG
Charles L. Sauerbier, Master	SS & MS, any GT	RG
Niels H. Olsen, Chief	SS, any GT	RG
Henrik E. Sievers, Chief	SS, any GT	RG
Chas. C. Wright, Jr., Chief	SS, any GT	RG
Boris A. Evert, 2nd Mate	SS, any GT	O
Walter C. Nilson, 2nd Mate	SS, any GT	O
F. W. Zinkiewycz, 2nd Mate	SS, any GT	O
Allison M. Reid, 2nd Mate	SS, any GT	RG
Homer Ligon, 3rd Mate	SS, any GT	O
John E. Mackin, 3rd Mate	SS, any GT	O
D. A. Thornton, 3rd Mate	SS, any GT	O
PORTLAND		
Stanley Paupper, Master	SS & MS, any GT	RG
SEATTLE		
Joseph A. Moldrem, Master	SS, any GT	RG
Richard Kreutzer, Chief	SS, any GT	RG
Lloyd David, Chief	SS, any GT	RG
Albert McCabe, Chief	SS, any GT	RG

Abbreviations: SS is steamship; MS is motorship; GT is gross tonnage; O is original license; RG is raise of grade. All of these licenses are for ocean service.

◆

Engineers' Licenses for March

Name and Grade	Class	Condition
SAN PEDRO		
George H. Mittan, 2nd Asst	SS, any GT	RG
SAN FRANCISCO		
Fred Bangs, Chief	SS, any GT	RG
William S. Crowe, Chief	SS, any GT	RG
Patrick McCoy, Chief	SS, any GT	RG
Bent Seneca, 1st Asst	SS, any GT	O
John Debenham, 1st Asst	SS, any GT	RG
Chan Lyman, 1st Asst	SS, any GT	RG
Charles Rockcliffe, 1st Asst	SS, any GT	RG
Robert F. Spear, 1st Asst	SS, any GT	RG
George L. Wahl, 1st Asst	SS, any GT	RG
Edgar Borges, 2nd Asst	SS, any GT	O
Merrell G. Daley, 2nd Asst	SS, any GT	O
K. V. Glessner, 2nd Asst	SS, any GT	O
David F. Mentzer, 2nd Asst	SS, any GT	O
Thomas P. Quilty, 2nd Asst	SS, any GT	O
Paul C. Roberts, 2nd Asst	SS, any GT	O
Eben F. Dawson, 2nd Asst	SS, any GT	RG
Frank L. Du Pont, 2nd Asst	SS, any GT	RG
Volney E. Julianel, 2nd Asst	SS, any GT	RG
Edw. C. Schwarz, 2nd Asst	SS, any GT	RG
Wm. E. Erickson, 3rd Asst	SS, any GT	O
C. C. Schleitweiler, 3rd Asst	SS, any GT	O
Bernard E. Stoakes, 3rd Asst	SS, any GT	O
Burnis O. Benny, Chief	MS, any GT	O
James F. Halpenny, 2nd Asst	MS, any GT	RG
PORTLAND		
J. D. Williamson, 3rd Asst	SS, any GT	O
SEATTLE		
R. W. Bowman, 1st Asst	SS, any GT	RG
John W. Clark, 3rd Asst	SS, any GT	O
C. L. Daniels, 3rd Asst	SS, any GT	O

Abbreviations: SS is steamship; MS is motorship; GT is gross tonnage; O is original license; RG is raise of grade. All of these licenses are for ocean service.

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Pacific MARINE REVIEW

"Ships Will Win the War!"

CAPT. HOWARD L. VICKERY, U. S. MARITIME COMMISSIONER
SAN FRANCISCO MAY 22nd, 1941

JUNE 1941

On the Job with America's Defense

U. S. ENGINEERS

The advance guard of defense, as well as offense, the projects of the U. S. Engineers are found scattered on the far-flung frontiers of America.

Important among such projects are the defenses rapidly being expanded among America's island outposts in the Pacific. To get supplies and equipment there is in itself an engineering problem of no mean proportions.

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Pacific MARINE REVIEW

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OUR COVER

portrays Captain Howard L. Vickery, United States Maritime Commissioner, addressing the capacity audience in San Francisco gathered in observance of National Maritime Day.

This "news photo" by Moulin Studios.

Official Organ

Pacific American Steamship Association

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Shipowners Association of the Pacific Coast

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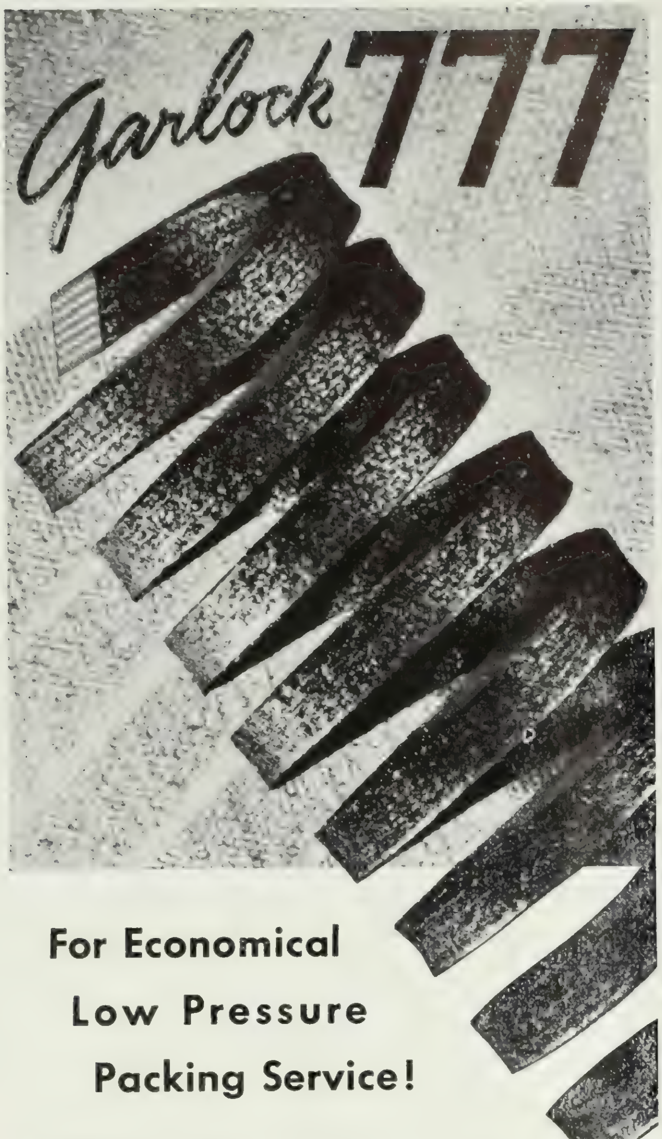

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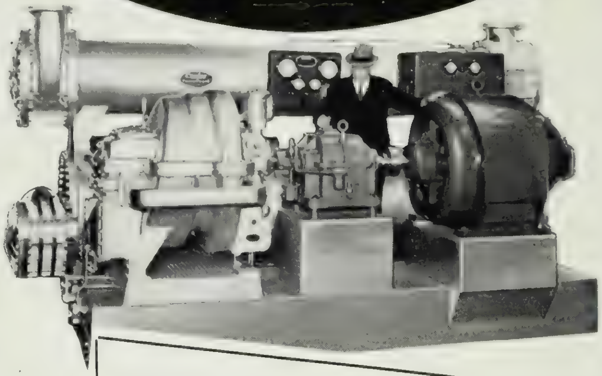

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Pacific
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REVIEW

Editorial Comment

The Battle of Shipbuilding

These are parlous times leading to much confusion in the mind of men.

Immediate first causes of this confusion are:

(1) The carefully prepared and so far brilliantly executed plans of a small group of men who are working to overthrow free civilization.

(2) The tremendous barrage—constantly spread before our eyes and continually beating on our ears—of conflicting ideas and noises concerning the present world crisis.

It is very refreshing, therefore, to hear speech on these matters from a man who is close to the inside circle and who expresses his thoughts thereon clearly, vigorously and convincingly.

Such was our experience listening to the Maritime Day speech of blunt, forthright, U. S. Maritime Commissioner Captain Howard L. Vickery, U. S. Navy, on May 22, at the San Francisco Commercial Club.

His topic was "The Battle of Shipbuilding."

Said he:

"America must build 4,000,000 to 5,000,000 tons of ships a year to obtain the slightest margin of safety." [Our delivery record in 1940 was less than 500,000 gross tons.]

"By the end of 1942 we can and should reach the goal of four to five million tons annually.

"Ships for defense must be our motto. We must keep shipyards busy 24 hours a day and stop loafing if we are to break the ring of isolation the Axis powers are forging around us.

"We must forget about the balance sheets and take the price tag off our efforts if we are to beat Hitler.

"Workers in shipyards certainly should not sell out America for two and a half cents an hour.

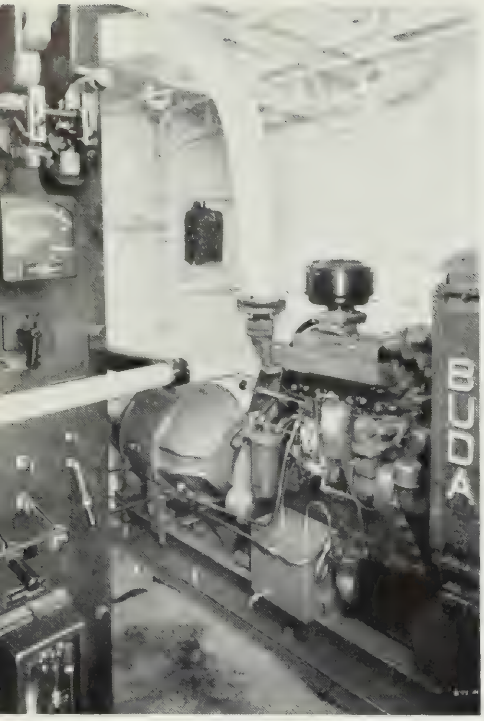
"We must protect our shipping in accordance with international law. If our shipping is destroyed, Britain is finished.

"There is nothing idealistic about our aid to Great Britain. Should she lose this war, we will be completely isolated, our markets and trade ruined, our way of life destroyed.

"There is a great deal of talk about 'sacrifice for National Defense.' So far we have had none of it, but the time is rapidly approaching when we will have it forced upon us in large measure.

"All transportation and production services will be rationed in the interest of National Defense items. Importations of luxury items will be stopped and already there is considerable curtailment of import of items necessary to the manufacture of products essential to our domestic economy.

"We are committed to an 'all-out' policy of aid to Britain and of preparation for our own National Defense. All our resources—materials, ships, trains, motor transport, air transport, capital—will be devoted to and managed for that purpose."



Emergency generator room

Tacoma Yard Delivers

Second of Five C-1 for the American

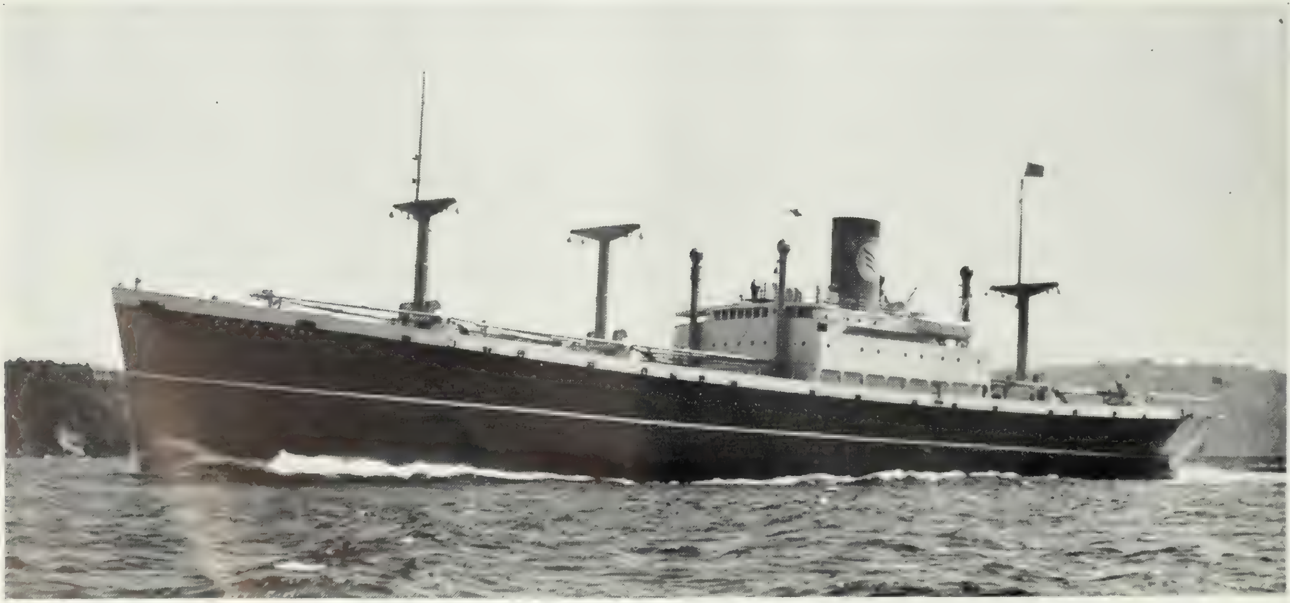
The illustrations herewith were all made from photographs taken on the new motorship Cape Flattery or in the Tacoma and Seattle yards of her builders, the Seattle-Tacoma Shipbuilding Corporation. The photographs are by Turner Richards of Tacoma and were all taken during or just after the official speed and economy trials of the vessel.

Cape Flattery is identical in every way with her sister Cape Alava, of which a full description was published in the May issue of Pacific Marine Review. Second in a series of five C-1-B cargo motorships building at Tacoma for the U. S. Maritime Commission and the American Mail Line, Cape Flattery was delivered May 30, after passing all tests satisfactorily.

During the course of these trials, she easily duplicated the fine results obtained with Cape Alava, making better than 18 knots speed and turning in a fuel consumption figure that was well below the guarantee.

Her maiden voyage itinerary is Tacoma-Seattle, Seattle-Columbia River, Portland-Orient. She was due to arrive at Seattle on June 4 after loading at Tacoma. After further loading at Seattle and at Columbia River ports, she was due to leave Portland June 11.

M. S. Cape Flattery on her trial runs in Puget Sound off Tacoma



Cape Flattery

Motorships Mail Line

Walter Green and O. A. Tucker, general managers respectively of the Tacoma and the Seattle yards, discuss shell plating

Some of the manufacturers whose products cooperated in producing this fine cargo vessel and who were not given prominent mention in the May article on Cape Alava are listed herewith:

Columbia Steel Company of California, who forged the anchors.

Kearfott Engineering Company, Inc., who fabricated and supplied the special windows.

The Blackman Co., Inc., who furnished the galley range and equipment.

Hopeman Brothers, who fabricated and installed the fireproof bulkheads and joiner work and furnished the metal furniture in the crew and passenger quarters.

Diehl Manufacturing Co., who supplied all the small ventilating fans and motors.

Welin Davit and Boat Corporation, who built and furnished all the lifeboats and the davits for lowering and hoisting same.

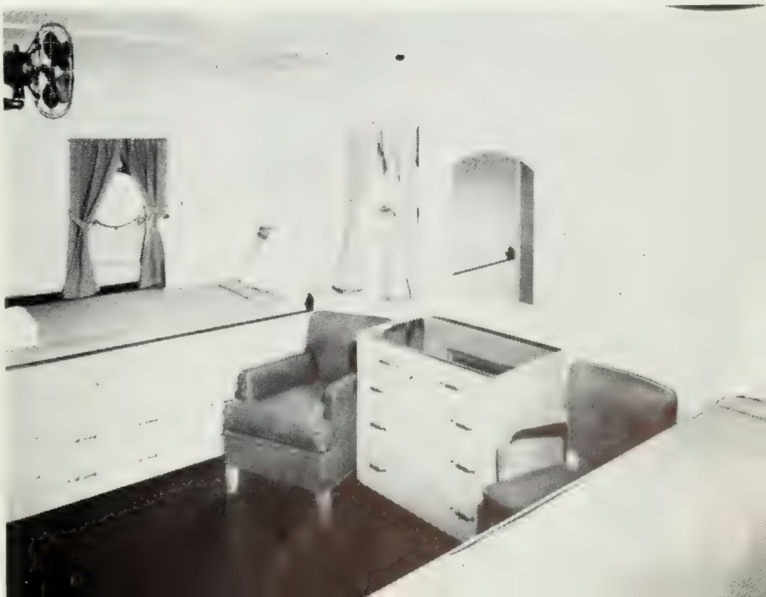
Plymouth Cordage Company, who supplied the Manila rope.

National Malleable and Steel Castings Company, who supplied each ship with 3000 fathoms of their $2\frac{1}{16}$-inch Naco stud link anchor chain.

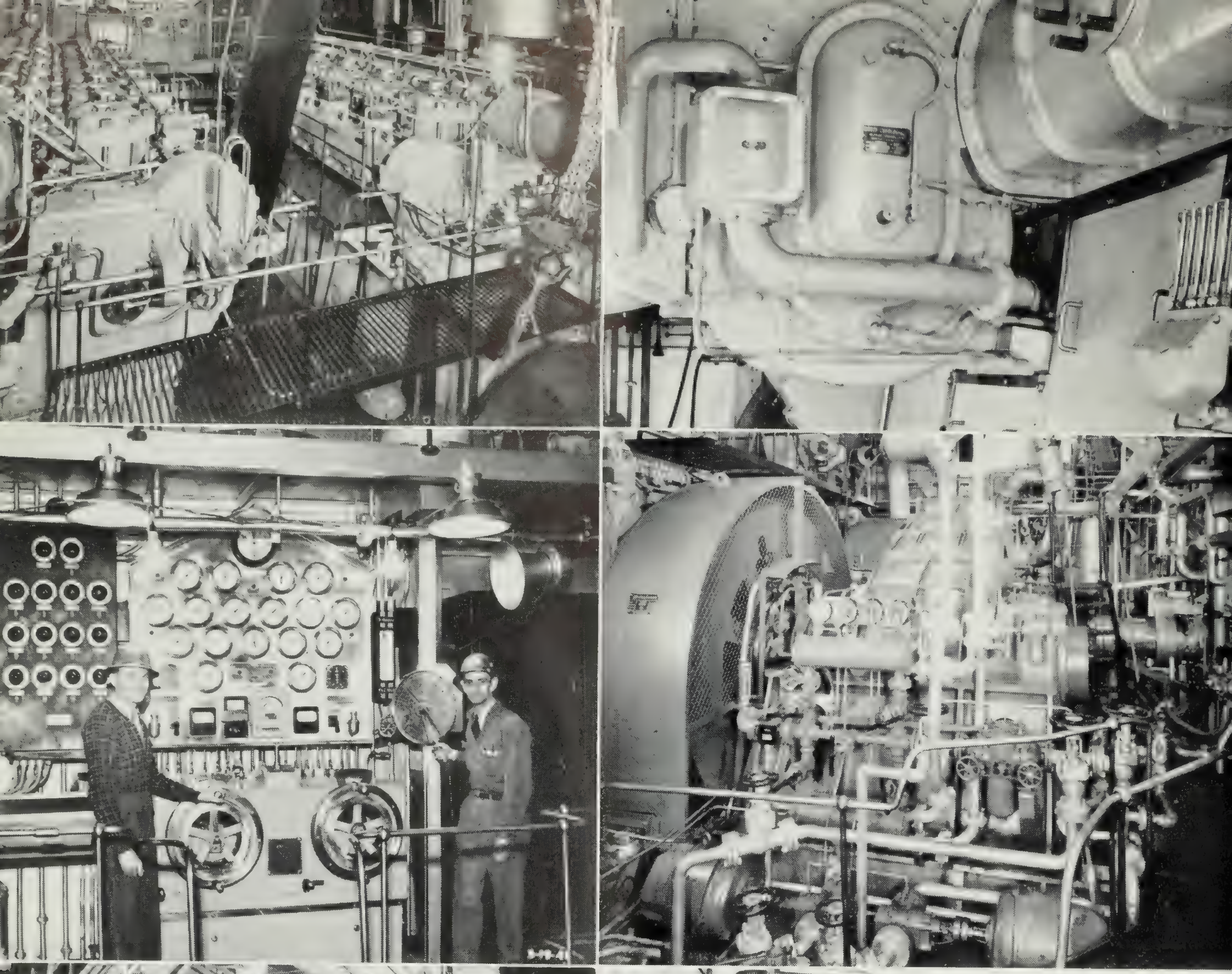
The Standard Sanitary Corporation, who supplied all the plumbing fixtures.

Cape Flattery is a fine capable seagoing motorship and, with her sisters, should render excellent cargo and limited first-class passenger service on American Mail Line's Oriental run.

President Lamont of the shipyard (left) and A. B. Langlie, Governor of Washington, are interested spectators as the wife of the Governor smashes the bottle



A trim and comfortable room for two passengers



Propulsion and Auxiliary Machinery, M. S. Cape Flattery

Upper left: working platform, engine room, featuring cylinder tops of Hamilton diesel engines. Upper right: scavenge blower on starboard engine. Center left: control stand, Chief Engineer Dan McKay at telegraph. Center right: Westinghouse electric coupling and gears. Lower left: Washington diesel auxiliary generating sets. Lower right: McKiernan-Terry steering gear

The Todd Shipyards Corp.

Its Relation to the New American Emergency Shipbuilding Plants

The annual report to stockholders by John D. Reilly, president of the Todd Shipyards Corporation is always a very carefully prepared statement that sets forth very clearly and concisely the year's progress in business. Since the shipyard responsibilities of this firm have grown so rapidly during the past 12 months that it has been well-nigh impossible to keep in touch, and many apparently contradictory statements have appeared in the press, we are glad to publish the statement to stockholders as of May 24, 1941, so far as it relates to shipbuilding activities.

Seattle-Tacoma Shipbuilding Corp.

"As mentioned in the last annual report, we associated with us for the construction and operation of a shipbuilding plant at Tacoma, Wash., a group of Pacific Coast contractors. This resulted in the organization of the Seattle-Tacoma Shipbuilding Corporation, of which your company holds 50 per cent of the stock. Since then, that company has delivered two vessels of the C-1 cargo-carrying type to the U. S. Maritime Commission, and will soon turn over the three vessels remaining under the original contract. In addition to the vessels covered by the original contract, the U. S. Maritime Commission has placed additional orders with that Company for 36 vessels and in connection therewith has authorized the expansion of the facilities of the plant at Tacoma. The cost of such expansion (without profit) will be reimbursed to that company. The U. S. Navy Department has also placed an order for five tankers.

"Seattle-Tacoma Shipbuilding Corporation has also, at the request of the U. S. Navy Department, established a shipbuilding plant at Seattle, Wash., to fill orders for the construction of 25 destroyers for the U. S. Navy, the keels of two of which were laid last month. This new plant, with the exception of the land, is being financed and paid for by the U. S. Navy Department. The company is constructing this plant for its actual cost and receives no profit for constructing it.

British Ships

"In December, 1940, after several months of negotiating with the British Government, represented by the British Purchasing Commission, your company extended its operations with the Pacific Coast associates and also included with them the Bath Iron Works Corporation, of Bath, Me., for the construction of 60 ten thousand dw ton cargo vessels. Building yards have been constructed at Richmond, Calif., and at South Portland, Me., 30 vessels to be built at each site, the British Government financing the cost of sites and establishment of the yards. Keels of several vessels on this account have already been laid down and the entire contract is expected to be completed by December, 1942. The affiliated companies handling this contract are Todd-California Shipbuilding Corporation and Todd-Bath Iron Shipbuilding Corporation, in each of which your company owns a 35 per cent interest.

Emergency Lease-Lend Ships

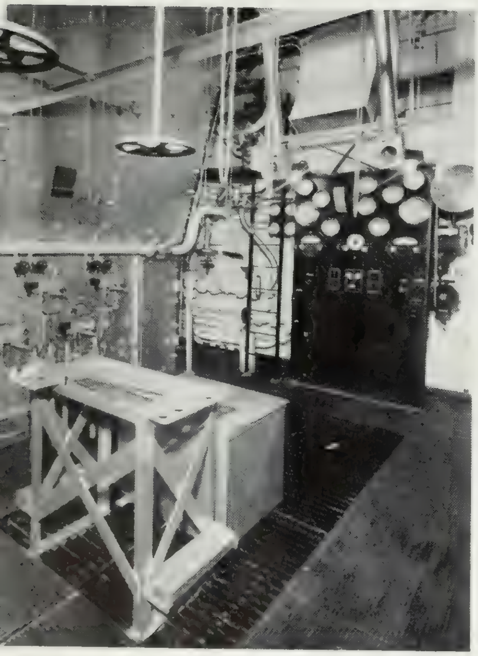
"Again the National Defense Program called for still more facilities, and the construction of additional vessels, resulting in the formation, with the same group of associates, of five more affiliated shipbuilding companies, namely:

Houston Shipbuilding Corporation, Houston, Texas
California Shipbuilding Corporation, Los Angeles, Calif.
Oregon Shipbuilding Corporation, Portland, Ore.
Richmond Shipbuilding Corporation, Richmond, Calif.
South Portland Shipbuilding Corporation, South Portland, Me.;

your company having a 50 per cent stock ownership in each of the companies just named, except the South Portland Shipbuilding Corporation, in which its stock holding amounts to 30 per cent. To these five companies have been awarded to date by the U. S.

(Page 55, please)

A keel is laid at the Seattle yard



Matson Navigation

Four Modified C-3s

Illustrations on this page show: S. S. Hawaiian Merchant just after launching practically complete at Federal yard; boiler front and combustion control board, S. S. Hawaiian Planter; and the turbines and gears of Planter

On facing page: the S. S. Hawaiian Planter; and a view looking aft on S. S. Hawaiian Merchant, featuring the cargo gear capacity

Hawaiian Merchant, a Matson Navigation Company new cargo steamer, slipped into Los Angeles Harbor very quietly on May 22, and the next day cleared for Honolulu. This vessel is the first of four modified C-3 type Maritime Commission cargo carriers for the Matson service between New York and Honolulu.

Two of these ships, Hawaiian Merchant and Hawaiian Shipper, were built at Federal Shipbuilding and Dry Dock Company yard, Kearny, New Jersey, and the other two, Hawaiian Planter and Hawaiian Packer, at the Newport News Shipbuilding and Dry Dock Company yard, Newport News, Virginia. The Hawaiian Planter sailed on her maiden voyage, New York to Honolulu, on May 20. Hawaiian Shipper, chartered temporarily to Isthmian Line, sailed from New York May 26 on their west-bound intercoastal service. She is due in Los Angeles June 13 and in San Francisco June 17. Hawaiian Packer will be delivered in the near future.

The four vessels are similar as to general characteristics, which are given in table herewith.

The propulsion plants and equipment are the same in principle, each having a set of cross compound double reduction geared turbines taking steam

Company Cargo Liners

for New York-Hawaii Run

at 440 psi pressure and 740° F. temperature, from a pair of modern water tube boilers.

In the Hawaiian Merchant and the Hawaiian Shipper, steam is produced by two type "D" Foster Wheeler generators with combustion under Mason-Neilan control, and is used in De Laval turbines connected to the propeller shaft through De Laval reduction gears.

In the Hawaiian Planter and the Hawaiian Packer, steam is produced in two Babcock and Wilcox marine water tube boilers with combustion under Bailey control and is used in Newport News turbines connected to the propeller shaft by Newport News reduction gears.

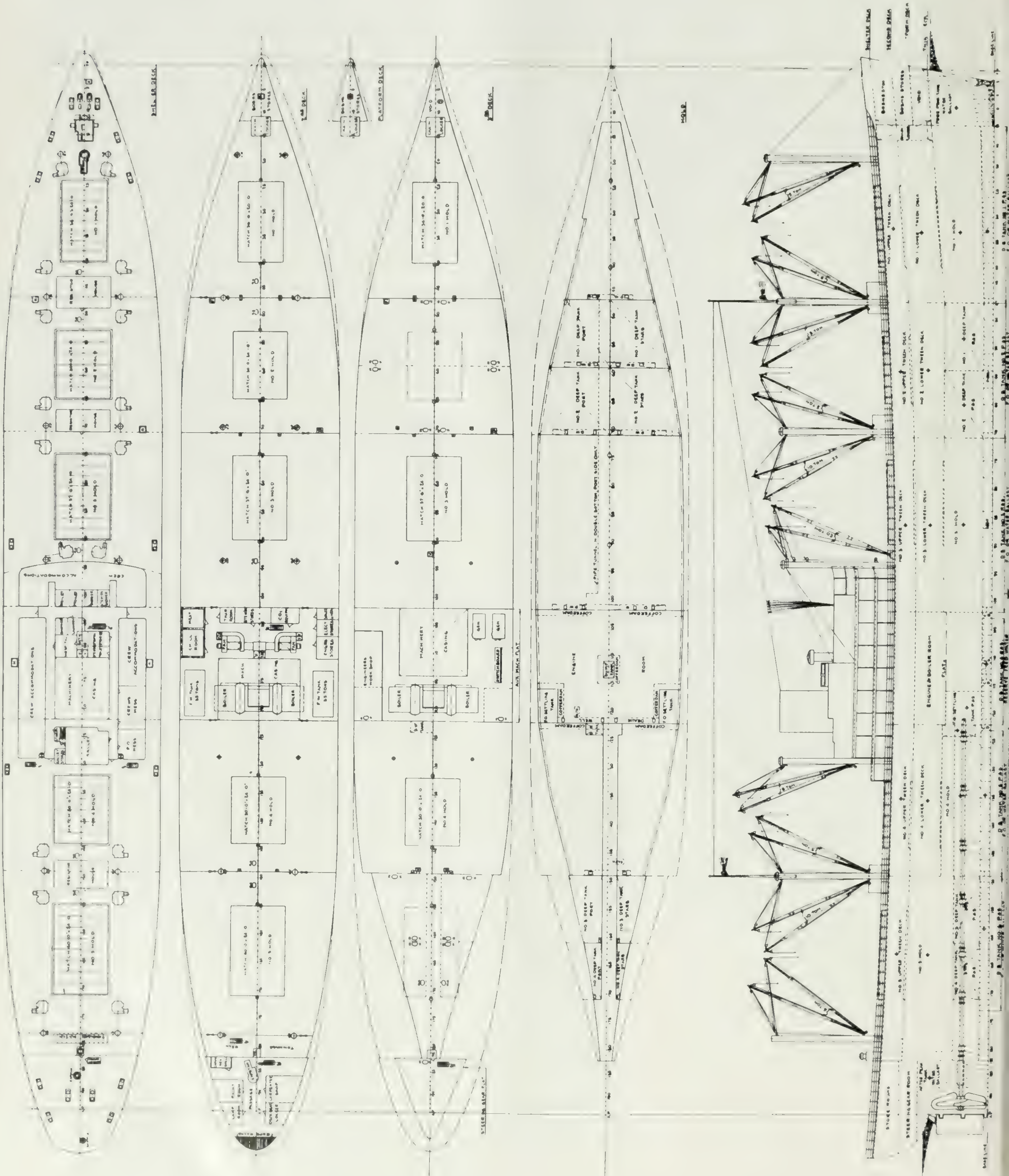
Modification from the standard C-3 design will be noted in the general arrangement plans and illustrations. The deck house has been shortened by the elimination of passenger accommodations. The raised forecastle is omitted. The cargo handling gear is increased by adding two sets of king posts and four cargo winches thus making all hatches double geared. The heavy weight booms and double-geared winches are shifted from hold No. 5 to hold No. 3 so that the hold of greatest capacity is served by the most powerful winches and the heaviest booms.

In making these changes there are naturally some differences produced in the general characteristics. The Planter and Packer have slightly heavier framing and are allowed 29′5⅞″ draft so that their displacement on loaded draft line is 18,260, their light weight of ship 5074 and their total deadweight capacity 13,186 tons. Merchant and Shipper have an allowable draft of 28′7$\frac{7}{16}$″, giving a displacement on load line of 17,615 tons. The light weight works out at 5185 tons giving a total deadweight capacity of 12,430 tons.

Principal Characteristics

Length overall	492′0″
Length between perpendiculars	465′0″
Beam molded	69′6″
Depth, molded, shelter deck	42′6″
Depth, molded, freeboard deck	33′6″
Draft, loaded	28′7$\frac{7}{16}$″
Gross measurement (approx.)	7,730 tons
Net measurement (approx.)	4,540 tons
Light weight of vessel (approx.)	5,030 tons
Total dwt. capacity (approx)	12,585 tons
Cargo deadweight at 28′7$\frac{7}{16}$″ draft	9,860 tons
Propulsion power, normal	8,500 shp
Specified sea speed	16½ knots
Cruising radius at 16½ knots	12,000 miles
Normal crew	43

General Arrangement Deck Plans and Profile S. S. Hawaiian Merchant



A Challenge To American Shipbuilders

by L. H. Korndorff

President Federal Shipbuilding & Dry Dock Company
United States Steel Corporation subsidiary

Once again the course of civilization will depend on the sufficiency of ships. Merchant tonnage has been sunk at about 290 thousand gross tons per month, and losses are occurring currently at a much higher rate.

Replacements by construction in the United States and in Great Britain have been at about 100 thousand tons per month. Great Britain has been able to carry on by diverting ships to essential services and by acquiring ships from other nations. This process can not continue forever. The total supply of ships becomes less and the need for ships increases as the war develops and spreads. It may be expected that sinkings will be increased, unless effective protection for merchant ships is adopted.

Certain fundamental characteristics of the shipbuilding business are pertinent. These are:

First—Paper work involved before actual construction of ships can be started. This includes: preparation of a master schedule to cover all elements; preparation of plans; purchase of material; and planning work of receipt and erection. Approximately 600 plans are necessary for the construction of a merchant ship and about 1600 for a destroyer. Ordinarily, preliminary work takes three to four months before keels can be laid. The success and speed of shipbuilding largely depends on this preliminary work.

Second—Labor. Ratio of labor cost to total cost runs from 30 to 50 per cent. Twenty basic trades are involved. Coordination of operations in proper sequence is of great importance to speed.

Third—The shipbuilding industry is not self-contained. Engine builders, boiler makers, pump manufacturers, electrical manufacturers and makers of miscellaneous equipment for galley and for navigation contribute a very large part of the cost of a ship. These items, including materials such as steel for the hull structure, aggregate in value about 40 per cent of the cost of the ship. All of this material must be purchased carefully and received in time to meet the overall construction schedules.

Fourth—There is an irreducible limit of time in which ships of a given type can be built. Machinery and equipment for a 10-knot ship or an 18-knot ship is practically the same, and it is interesting to note that the hours of shipbuilding labor are nearly as much for the simplest cargo boat as for the modern cargo ship with much higher priced and more efficient machinery and equipment.

At no time in its history has the American shipbuilding industry, as a whole, been in a better position to serve the country efficiently than it is today.

(Page 69, please)

L. H. Korndorff, president Federal Shipbuilding and Dry Dock Co.—master shipbuilder

Shipping Legislation Pending

Some Resolutions and Bills Now Before the U. S. Congress

Introduced in the House and now pending before the Committee on Merchant Marine and Fisheries are some seventy-odd resolutions, part of the usual deluge that always floods the opening of a new Congress. By the middle of April this flood had reached the 4500 mark and was still rising rapidly.

Here are thumbnail descriptions of some of the bills now pending:

On May 19, House Resolution 3783, as amended, was unanimously passed by the House of Representatives and goes to the Senate, where it will undoubtedly be passed before this article is printed. This bill carries considerable interest for shipowners and shipyards. It is very short, authorizes the President to "acquire, convert or undertake the construction of 550,000 tons of auxiliary vessels of such size, type and design as he may consider best suited for the purposes of National Defense, such vessels to be in addition to those heretofore authorized. There is hereby authorized to be appropriated such sums as may be necessary to effectuate the purposes of this act."

After the Act of April 5, 1941, 26 auxiliary vessels of 238,000 tons were acquired for which appropriations were to be covered by later legislation. As we understand this present bill, it covers those 26 vessels plus 312,000 tons additional, yet to be acquired.

We note in this bill that the term tons is not defined, and, as there is no limit put on cost, it is evident that the President is given very wide latitude in acquiring ships. The number of vessels included would certainly vary greatly, according to choice of tonnage used. The Navy might get four times as many on net tonnage figures as they could get using displacement tonnage, with corresponding multiplication of the "such sums as may be necessary to effectuate the purposes."

H. R. 167—To authorize Maritime Commission to furnish suitable vessels for state nautical schools of New York, Massachusetts, Pennsylvania and California. Vessels to be new with modern equipment; would appropriate $10,000,000 for building same. Federal operating appropriation to match that of state but not to exceed $50,000 per year for any one school.

H. R. 554—To exempt sail vessels not carrying passengers for hire from merchant marine act provisions requiring able seamen as crew. Sixty-five per cent of sail ship deck crew must have served six months or more in deck crew of sail vessels.

H. R. 555—To apply laws governing steam vessels to passenger-carrying motor vessels under 65 feet length overall.

H. R. 556—To make unlawful the employment of any person under 16 in any capacity on board any vessel and of any person under 18 in the engine department of any vessel or in any capacity on vessel of 100 tons gross or over.

H. R. 557—To implement the provisions of the Shipowners Liability Convention of 1936 as regards shipowner's liability for sick and for injured seamen.

H. R. 558—To extend to undocumented and unsubsidized vessels the citizenship requirements for officers and crew. One hundred per cent officers and seventy-five per cent crew to be citizens, balance to be (1) citizens of a U. S. insular possession, (2) aliens lawfully admitted prior to July 1, 1930, or (3) aliens who have been law abiding residents of good repute continuously since July 1, 1925. This extension covers all employees aboard ship including all persons sharing in the lay on fishing vessels.

H. R. 559—Revises and strengthens the revised statutes, Sec. 4311 et sec. in regard to limiting coastwise shipping and fisheries to American-owned vessels.

H. R. 560—To establish a system of unemployment insurance for the maritime industry and under the management of the Railroad Retirement Board.

(The bills herein mentioned, with numbers from 532 to 560 were introduced by Mr. Bland of Virginia.)

H. R. 955—To provide Maritime Commission aid to producers of lumber and of timber products.

(Introduced by Mr. Angell of Oregon.)

H. R. 2504—Authorizes the construction and equipment of a marine hospital at San Diego, California.

(Introduced by Mr. Izac of California.)

H. R. 1022—Provides for the construction of a marine hospital at Los Angeles.

(Introduced by Mr. Geyer of California.)

H. R. 1077—Authorizes the U. S. Navy (on request by Governor of a State) to provide a suitable vessel of the Navy to any nautical school which may be established and maintained at any of the following ports: Boston, Philadelphia, New York, Seattle, San Francisco, Baltimore, Detroit, Saginaw, Norfolk, Corpus Christi; and Rockland, Maine.

(Introduced by Mrs. Smith of Maine.)

H. R. 1395—To provide for construction of a marine hospital in Florida.

H. R. 1397—To provide for construction of a marine hospital in Jacksonville, Florida.

(Nos. 1395 and 1397 introduced by Mr. Green of Florida.)

H. R. 1585—Provides freedom from all Federal taxes of ship construction reserve funds set up by non-subsidized operators.

(Introduced by Mr. Boykin of Alabama.)

H. R. 1616—Amends Sect. 509 of Merchant Marine Act of 1936 by adding a new subsection that provides construction of Commission - approved ships under a 12½ per cent payment of cost by American citizen, and assumption of balance to be met in twenty annual payments. No construction subsidy. Naval defense features paid for by Commission.

(Introduced by Mr. Oliver of Maine.)

H. R. 2074—An amendment to Section 353(b) of the Communications Act, 1934, giving Commission more leeway in qualifications of operators.

(Introduced by Mr. Bland of Virginia.)

H. R. 2092—Authorizing construction and equipment of a marine hospital in Florida.

(Introduced by Mr. Peterson of Florida.)

H. R. 2520—An amendment to an amendment of the Merchant Marine Act of 1936. Exempts yachts, tugs, towboats and unrigged vessels from certain restrictions as to crew ratings.

(Introduced by Mr. O'Leary of New York.)

H. R. 3252—To make emergency provision for certain activities of the Maritime Commission.

(Introduced by Mr. Bland of Virginia.)

H. R. 3743—To provide adequate facilities for the transportation to foreign ports of bulk commodities produced in the United States. Specifically names coal, wheat and lumber. Authorizes construction of twenty vessels by Maritime Commission. Authorizes $60,000,000 appropriation for purpose.

(Introduced by Mr. Kee of West Virginia.)

H. R. 3864—To amend the "Act to provide for the registry of pursers and surgeons as staff officers on vessels of the United States."

(Introduced by Mr. Bland of Virginia.)

H. R. 4015—To re-amend paragraph four of section 15 Shipping Act of 1916.

(Introduced by Mr. O'Brien of New York.)

H. R. 4088—To authorize Maritime Commission to purchase and charter vessels of domestic and foreign registry and to provide insurance and re-insurance for such vessels and further operations.

(Introduced by Mr. Oliver of Maine.)

H. R. 4107—Extends for two years provisions of title X, Merchant Marine Act of 1936.

H. R. 4224—Liberalizes experience qualifications for manning inland vessels of 500 gross tons or less not carrying passengers for hire.

H. R. 4225—Liberalizes manning qualifications on inland water sail vessels of 500 gross tons or less not carrying passengers for hire.

H. R. 4258—Makes the carrying on board or the possession of any narcotic drug on any United States vessel a felony punishable by fine and imprisonment.

(Nos. 4107 to 4258 introduced by Mr. Bland of Virginia.)

H. R. 4255—Amends nautical school law by striking out clause limiting appropriations for any school to $25,000.

(Introduced by Mr. Ford of California.)

H. J. R. 43—To allow foreign registration of American-owned vessels.

(Introduced by Mr. O'Leary of New York.)

H. J. R. 139—To provide suitable vessels for the use of certain state nautical schools.

(Introduced by Mr. Bland of Virginia.)

In addition to these merchant bills pending, there are a number of interesting resolutions which if passed would be of far-reaching effect on the fisheries industry and the construction of fishing boats. For instance:

H. R. 3254 would prescribe that every deep-sea fish boat of 15 gross tons or more:—shall be good and seaworthy with sufficient bulkheading to insure one-compartment floodability; shall be equipped with two bilge pumps, one of which is mechanically operated and so constructed that it may be used as a fire pump; shall be equipped with at least two ring buoys and attached ropes; shall carry at least one life preserver for each person aboard; shall carry sufficient lifeboat or dory capacity to carry all persons aboard (each boat to be equipped with flare, compass and provisions); shall be equipped with radiotelephone and complete first aid kit; shall be equipped with at least three line carrying projectiles and means of propelling them; shall be navigated in charge of an operator licensed by the local board of inspectors of the Bureau of Marine Inspection and Navigation; and shall be inspected at least once a year by the Bureau to determine that the hull, machinery and equipment "is suitable for the service in which it is employed and is in a good and seaworthy condition."

H. R. 4700 passed unanimously in the house on May 19 and went to the Senate where it will undoubtedly be passed before this article appears.

This bill provides for "priorities in transportation by merchant vessels in the interest of national defense and for other purposes."

During the emergency but not after June 30, 1943, the President may, whenever he deems it in the interest of national defense, authorize the U. S. Maritime Commission to issue warrants of priority in respect to any vessel of the United States, or owned by citizens of the United States. Priority shall be with respect to use of facilities for: loading, discharging, lighterage or storage of cargoes; procurement of fuel; and overhauling, drydocking or repairs.

The bill is naturally of great interest to shipowners, terminal operators and ship repair yards. However, it will not come as a surprise or shock, since, in effect, it merely provides method and legality for a practice already operating to a very considerable extent.

America's Need For Merchant Vessels

by Edward C. Maussbardt

Pacific Coast District Manager, U. S. Maritime Commission

From time immemorial, international trade has been a matter of vital interest to the nations of the world and, more than anything else, probably has been a moving factor in the shaping of their destinies. From the beginning of civilization, sea trade and problems in the conduct of foreign commerce have been foremost in men's minds.

The civilization of the ancients was based upon the carrying on of trade, and history records that nations very early recognized the desirability of maintaining trade routes for the exchange of goods necessary to the well-being of their people.

Indispensability of freedom of the seas, for the maintenance of trade between nations, and of adequate rules to regulate ocean trade and commerce, is an established fact. The present war amply demonstrates this fact.

It is common knowledge that the outbreak of hostilities abroad has seriously disrupted the normal operation of the American Merchant Marine. The result has been cessation of American flag services to all European ports from the north coast of Spain to Bergen, Norway, and all Mediterranean ports.

The repercussions permeate our national economy. Rate increases, with a subsequent increase in cost to the consumer, have and are being established in many services, including those not directly affected.

To meet these conditions, the U. S. Maritime Commission rerouted many vessels and became engaged in a larger shipbuilding effort than ever before attempted in this or any other country.

The headline news of the day is, of course, national defense, and perhaps at this time, it is fitting that we emphasize that part of this program which has been assigned to the U. S. Maritime Commission.

Edward C. Maussbardt

Defense Means Ships

Naturally, the defense materials which come from abroad for our factories and mills must be transported to our shores, and this means cargo ships and more cargo ships. In addition, the need of Britain for cargo ships again calls for ships and more ships. It is naturally agreed that all the ships that can be built are required.

Many misguided people believe that more shipyards will produce more ships, forgetting that any extensive expansion of new shipyards in the United States will be effected only at the expense of efficiency and economy, to say nothing of the attendant delay.

The various local offices of the Maritime Commission, and the Home Office at Washington, D. C., are busy with proposals for new shipyards, and I know no better answer to this problem than that given by Admiral Land, in a recent radio address.

"The Maritime Commission has probably received proposals for at least one thousand new shipyards, and I don't know how many more thousand shipyards died aborning in the sensible discouragement of local interests. There seems to be a theory that in a time of emergency the Government should hold out a large, full moneybag and pour its contents into the hands of any wandering, wishing promoter. A promoter is a man who will furnish the ocean if you will furnish the ships. Some of the men and organizations who have been to the Maritime Commission with proposals for new shipyards have offered but one thing, and that was the idea that they would like to build and operate a shipyard at Government expense.

"These promoters, with their offices in their hats, are well-meaning and, in many cases, patriotic, but they don't realize that years of training and skill are needed to build ships. They wouldn't hire a cook whose sole stock in trade was a desire to be paid for cooking and who intended to use her first pay check to buy her first cookbook. Well, the Government isn't hiring shipbuilders who have never built ships before."

I believe you will agree that there is plenty of meat in that sandwich.

Emergency Shipbuilding

Our shipbuilding today is in excess of 9½ billion dollars in value. Of this, approximately 7½ billions represent Navy construction and approximately two billion, construction of merchant vessels for both the Maritime Commission and private account.

It is of paramount importance that the delivery of finished efficient vessels in the shortest possible time be the issue, inasmuch as this is a time of emergency, which I interpret as meaning a crisis requiring efficient and rapid action.

To meet this emergency demand, the President authorized the building of 212 ships for Britain and her allies. This will be effected by adding 56 ship ways to existing shipyards; seven new yards may deliver 112 additional vessels, and the other 100 are to be obtained by laying keels in existing private yards on every ship way as soon as it is vacated by a launched merchant vessel.

Contracts for 184 of these 212 ships, to cost approximately $364,800.000, have been awarded by the Maritime Commission and cleared with the Office of Production Management, as announced by the Commission on April 18. Of the 184 vessels, 112 are of the emergency type of cargo carriers, of ten thousand deadweight tons.

The other 72 ships included in the awards referred to are single screw, high speed, Commission - designed tankers, of 16,000 deadweight tons, to be constructed by the Sun Shipbuilding and Dry Dock Co., Chester, Pennsylvania, to cost approximately 180 million dollars.

Pacific Coast Shares

Contracts for 112 emergency ships will cost approximately $184,800,000, for which the California Shipbuilding Corp. of Los Angeles and the Richmond Shipbuilding Corp. at Richmond, California, each received contracts for 24 ships totaling $39,600,000, for each yard and the Oregon Shipbuilding Corp. at Portland, Ore., was awarded contracts for 12 ships at a cost of $19,800,000.

All of these vessels are to be constructed within a two-year period, with deliveries at stated intervals throughout that time. Our long-range program shows an expenditure of $119,672,000 for vessels to be built on the Pacific Coast, to which should be added 99 million dollars for vessels to be built under the emergency and constructed in Pacific Coast yards.

Contracts now awarded and authorized call for approximately 764 merchant ships. Naval vessels under contract amount to 913, to say nothing of numerous small craft for naval use. Naturally, the present shipbuilding facilities of this country are at their highest peak.

Of the 764 merchant vessels building or under contract in the United States as previously mentioned, 261, or approximately 35 per cent are being built on the Pacific Coast.

This West Coast construction will total 2,787,591 deadweight tons and will cost approximately 540 million dollars.

Of this Pacific Coast program, 177 ships are to be built in California yards, amounting, in round figures to about 355 million dollars.

Yes, "America Needs Ships," and the Pacific Coast is receiving its share of business to achieve that goal.

These transactions by the Commission complete, within two weeks of the date of the announcement by the President, of the second 212 ship emergency program, the arrangements for the building of the necessary shipyard facilities and the bulk of the ships.

Program Requirements

Thus, the overall requirements of the emergency ship construction program call for delivery of 412 vessels within the ensuing two-year period. To carry out this program, $550,000,000 of the funds appropriated by the Lease-Lend Act have been allocated to the Commission, making a total of $900,000,000 to be expended in the next two years for the construction of emergency vessels.

This is a vast program; however, past performances indicate, and I firmly believe that we can accomplish this program as now laid down, with the proper cooperation of all those involved.

To accomplish this, the shipbuilding industry must raise the number of men employed to approximately six times the normal. One of the biggest problems, therefore, is the obtaining of the necessary skilled and semi-skilled help, especially including artisans, loftsmen, machinists, shipfitters, welders and riveters. This requires an intensive

The Mormacstar C-3 cargo steamer built at the Moore Dry Dock Co., Oakland, California, yard program of training for these trades, which must be adopted without delay.

Modern ship construction, in all its features, is a highly skilled specialized affair, and the manner in which you build will largely determine the life of the vessel and the upkeep costs throughout its life.

After the vessel is created, the next move is to provide competent personnel, some to navigate, some to keep the mechanical equipment up to standard and forever moving, and some to keep the personnel well-housed and fed—in other words, contented.

I am citing these facts because too often, those of us not in the maritime industry, think of ships as steel hulls, propelled automatically by machinery which never gets out of order and which automatically loads the cargo, warps the vessel out of the slip, navigates it across the ocean, makes a perfect landfall, and then automatically noses in to a slip in the foreign port before automatically discharging cargo.

One of the most important jobs before the Maritime Commission is to encourage the employment of first-class personnel throughout the various departments of American vessels. This is just as important as the building of fine ships, for no matter how good a ship you build, the operating personnel must be equal to the ship. Without proper and well-trained officers and men a ship is worse than useless. It is a danger to property and a hazard to navigation.

The Commission has therefore conducted a training program which has given instructions to more than 13,000 men.

The Maritime Commission is training more than 600 young men in its Cadet program. More than 100 of the Cadet officers have already been called to active duty by the Navy. All Cadets are members of the Naval Reserve.

In the U. S. Maritime Service, which trains licensed and unlicensed personnel and apprentice seamen, there are approximately six thousand now enrolled. Our seamen and officers are learning to do their jobs efficiently and are glad of the opportunities offered.

At Hueneme, near Oxnard, California, the Commission is installing buildings and equipment at a cost of $750,000 for the instruction of apprentice seamen. Attached to that station will be a school ship which is being converted and outfitted at a cost of $1,750,000.

An important part of that training program has dealt with the provision of officer replacements. The four state nautical schools, of which our "California State" located here at San Francisco is one, have now become an integral part of that program for providing officers.

As many of you know, under the Reorganization Act, the President transferred the duties of the Navy Department, with relation to these schools to the Maritime Commission, and it is anticipated that many of the officers of the merchant marine will come from such state schools.

Summarizing the Commission's entire training program, up to April 1, 1941, there have been enrolled in the various courses, the following number of men:

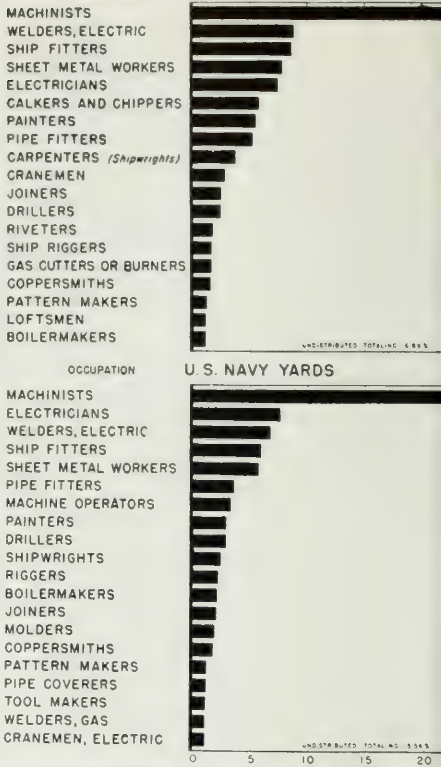
Licensed officers	1,235
Unlicensed seamen	4,930
Apprentice seamen	1,616
Cadets	670
Cadet officers	347
Visual signaling	2,333
Correspondence courses	2,705
A total of	13,836 seamen

The surveys made indicate conclusively that the requirements for trained seamen in the American merchant marine in the near future will be the greatest this nation has known.

After being successfully launched and manned, the vessel is ready to go on berth. Freight must be secured, and when secured, stowed, each commodity in its proper place and so placed that the sequence of discharge is not disturbed or unnecessarily delayed. It is to be borne in mind that a quick turnaround helps the right side of the ledger and damaged goods, due to improper handling or stowage, can quickly eat up all the profits, even though assumed to have been earned.

Then, when the vessel is loaded, a successful voyage to ports of destination must be accomplished, and this on schedule, if at all possible. On arrival at ports of destination, discharge and loading of additional cargo are again carried out, and this endless cycle continues until the vessel arrives at her home port or ports, always bearing in mind that time is usually the essence of all maritime and commercial transactions.

ADDITIONAL SKILLED WORKERS NEEDED IN SH
ON CONSTRUCTION AND REPAIR OF U. S. GOVER
BRITISH AND PRIVATE VESSELS, BY SEPT. 1



COURTESY OF UNITED STATES BUREAU OF LABOR STATISTICS

Now this is all there is to the shipping business. It sounds simple, but through this cycle, specialized, skilled personnel is needed to perform the many requirements, be they construction, operation or traffic, which go to make a voyage a successful venture. It is safe to say that shipping is the most hazardous, highly competitive business known to the world today.

Every real seafaring man's dream is a fine ship, a contented and efficient crew and a prosperous voyage, and a little cooperation on all sides can and will make the dream come true.

These simple facts—that ships mean trade, independence and security—were recognized in the early life of this nation, and I am sure that the events since that time, especially recently, clearly demonstrate that our shipping and commerce are of the greatest concern to all of us. Also, from the facts outlined above, it may be said without fear of contradiction, that the Pacific Coast has demonstrated that the yards, the management and the men can be trusted to produce the vessels now or hereafter authorized, and hold a commanding position in an industry that is inherent in a people to whom the smell of salt water is as manna from heaven.

(Address before San Francisco Advertising Club, San Francisco, May 14th, 1941.)

An Interesting Collection of Ship Models

At No. 2 Broadway, high above the din of New York's busy thoroughfare, is the office of the Weaver Shipping and Oil Company, and here its chief executive, David C. Reid, has surrounded himself with a fine group of models of sailing vessels. In fact, his hobby and principal pastime for many years has been the study of models of sailing ships and the acquisition of any distinctive and authentic specimens that were available. The result is a collection of models of wind-powered vessels that is acknowledged to be one of the finest and most complete under private ownership in the United States.

The illustration shows one of the most beautiful examples of the ships built of bone by prisoners of war during Napoleon's day. This vessel is the British ship of the line Queen Carolyn, one of Nelson's fleet at Trafalgar. Our picture features the elaborately carved stern of the vessel with its overhanging galleries, known as the Admiral's walk, the Captain's walk, the Ward Officer's walk, and the Midshipman's walk. All of the cordage used in the rigging of this model is of spun human hair.

For the making of these models, the prisoners saved all the bones from their meat rations and gradually carved these bones into the carefully shaped pieces that are fastened together to form the hull surface and the top hamper of a beautiful ship.

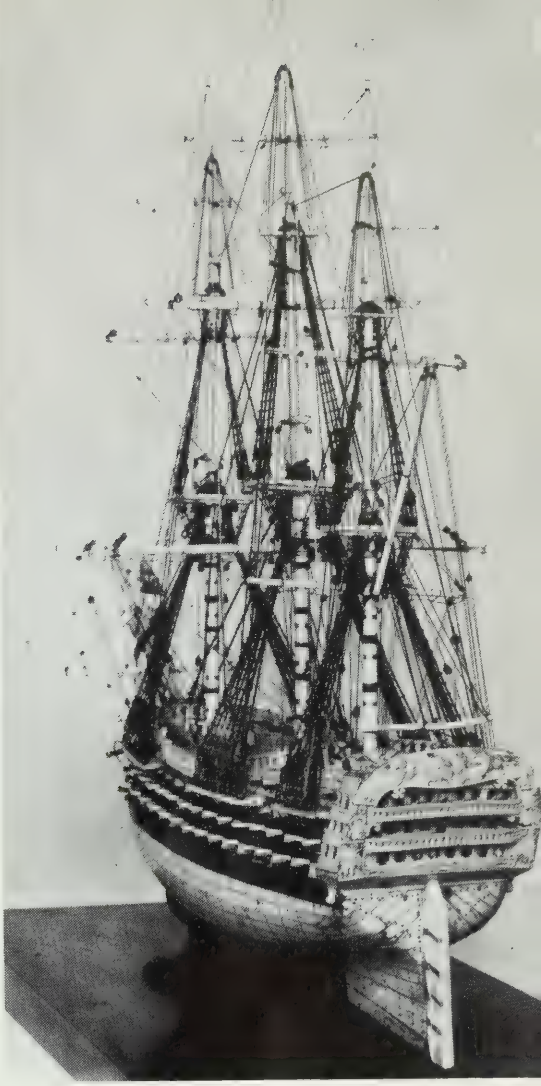
A close examination of such models fills the mind with amazement at the patience, skill and ingenuity that is evident in their fabrication and erection.

Such models have to be handled with great care for they are very easily damaged, and once damaged it is practically impossible to find an artisan who can effect proper restoration. In fact, so far as our modern merchant marine is concerned, carving in bone (scrimshaw work), such as was formerly practiced by the whalemen and deep-sea sailors, is practically a lost art.

Another model of great interest in the Reid collection is the exact scale replica of the Clipper ship Staghound. The original of this model was one of the notable examples of her class, built by the famous Donald McKay at East Boston and launched December 7, 1850. She was the first of the "very sharp" clipper models, and at the time of her launching was the "largest and longest" American merchant vessel, with an overall length of 227 feet, a beam of 39 feet 8 inches and a depth of hold 21 feet, and she spread 11,000 yards of canvas. So far as the records can be traced, her best logged speed was a little over 17 knots and her best day's run was 358 nautical miles.

She was burned at sea with a cargo of coal, October 12, 1861.

The model of Staghound is said to be exactly to scale dimensions in every detail. Authorities on sailing ships, writing about this ship shortly after her launching, hailed her as "the prettiest ship as regards model for speed that McKay ever turned out." However, her chief claim to distinction was not for record speeds, but lies in the fact that on her first round voyage (New York-San Francisco-Whampoa-New York) the net earnings paid for the entire cost of the ship plus a dividend of $80,000 to her owners.



Bone model of British ship of the line Queen Carolyn

In these days of instantaneous communication and transportation speeds far faster than any wind velocities, it is very refreshing sometimes to get back in imagination to somewhat slower but, to many men, more inspiring days one hundred years back when our grandfathers were laying the foundations for the future, which is now our present. We know of no more interesting way to get back into those days than to visit a good collection of sailing ship models.

The several first-class public collections include:

Smithsonian Institute, Washington, D. C.

Maritime Museum, Newport News, Virginia.

U. S. Navy Collection, Annapolis, Maryland.

Maritime Exchange Collection, Aquatic Park, San Francisco, Calif.

Sun Launches

M. S. China Mail for American Mail Line

China Mail slides gracefully into the Delaware. Below, at the outfitting dock, her prow rears proudly against the sky

The Pacific Coast and particularly the Pacific Northwest are vitally interested in the three fine motorships building for the American Mail Line at the Chester, Pennsylvania, yard of the Sun Shipbuilding and Dry Dock Co., and now nearing completion.

These vessels are to be named China Mail, Island Mail and Japan Mail. China Mail was launched May 24, and the other two ships will be launched on June 21 and July 21, respectively. It is expected that China Mail will be delivered July 25, 1941, ready for service.

All three ships are built to the C-2 SO design of the Maritime Commission and are primarily for cargo with a limited first class passenger accommodation for 12 passengers.

The main propulsion plant is Sun-Doxford opposed piston type diesel engine with five power cylinders, each having a bore of 32 inch diameter. The combined stroke of the two pistons in each cylinder is 95 inches. This engine is rated 7500 bhp at 92 rpm, 8250 bhp at 95 rpm and 9375 bhp for two hours at 102 rpm.

China Mail has an overall length of 474 feet, beam of 62 feet, depth of 40 feet, and shaft hp of 7,500. Gross tonnage is 6,500 tons, net 4,000 and displacement 15,000. Designed speed fully loaded is 16½ knots. Sponsoring the new vessel was Mrs. Richard J. Reynolds, Winston-Salem, North Carolina, whose husband is a director and large stockholder in the American Mail Line. Others in attendance were Lawrence Calvert, president, American Mail Line; S. L. Barnes, secretary and chairman of the board, both of Seattle; Ralph Shaffer of Tacoma and T. F. Gleed of Portland, both directors. Representatives of both the Seattle and Tacoma Chambers of Commerce and of the Washington congressional delegation were also present. The Island Mail, second of these carriers for the same operators, is expected to be off the ways on June 2 and will be christened by Mrs. Lawrence Calvert; the Japan Mail is to be launched in July and will be sponsored by Mrs. S. L. Barnes. In addition to these vessels, the American Mail will be assigned three other C-2 types that are to be built by the Federal Shipbuilding Co., Kearny, N. J. Keel for the Seattle Mail, first of these vessels will be laid in November, and she will be delivered in April, 1942; the Tacoma Mail will be delivered in May, 1942; and the Portland Mail in June, 1942.

N. A. M. E. Holds Spring Meeting

The society of Naval Architects and Marine Engineers held its Spring meeting at Washington, May 23; paid a visit of inspection to the great new David W. Taylor Model Towing Basin at Carderock, Maryland; sat down at a luncheon for 400 at the Mayflower Hotel; listened patiently to a fiery "all out" emergency, after-luncheon speech by Frank Knox, Secretary of the Navy, introduced by Rear Admiral Emory S. Land, U. S. Navy (retired), chairman of the U. S. Maritime Commission and president of the society; and discussed two technical papers presented by naval officers attached to the Model Basin.

In his introduction of Secretary Knox, Admiral Land made this rather trenchant statement: "No matter what figures are given out, no matter how they are interpreted, no matter how they may be misinterpreted, our shipping situation is serious to desperation."

The speech of Secretary Knox was largely a warning of the difficult task that lies aread.

"It is not going to be easy to defeat this thing that is now abroad in the world.

"We aren't going to continue to lead the kind of lives we are leading now.

"We are going to win through, only by a series of sacrifices here in America that match the sacrifices of the British people.

"Victory in this war is going to take a long time—is going to cost an awful price, but it is worth that price.

"All of us in the United States are going to have to forget our bookkeeping. We are going to be more and more compelled, and willing, I hope, to turn into the common pot all of our profits and more than our profits.

"I possess no crystal ball in which I can foresee the future, but I dare say this to you, that in the days that lie ahead, unless a swift change comes, we men of this generation are going to be called upon for sacrifices that will match in their seriousness and in their size and comprehension, any sacrifices that have been made by any American generation that has gone before. It is going to take all that we have. I humbly pray God that we shall match up, with our courage and our resolution, to that which has been demonstrated over in that tight little isle from which so many of us have descended."

This speech must have reminded its hearers of that fateful epigram used by Churchill in a speech to the House of Commons when he took over the defense of Britain. "Gentlemen, all I can promise you is sweat and tears and blood."

The first technical paper to be discussed was the third installment of a monumental paper, describing the Model Basin and its work. This paper was prepared and presented by Captain Harold E. Saunders, U.S.N., technical director of the Model Basin.

The second paper was entitled "Variable Pressure Water Tunnels at the David W. Taylor Model Basin." It was prepared and presented by Lieut. Commdr. Albert G. Mumma, U.S.N. who is in full charge of this feature of the Model Basin.

Left to right: the Honorable Ralph A. Bard, Assistant Secretary of the Navy; his Britannic Majesty's Ambassador Lord Halifax; Rear Admiral Emory S. Land, president of the Society of Naval Architects and Marine Engineers and chairman of the United States Maritime Commission; and Rear Admiral H. Pott, British Naval Attache

The Welded Bulkhead

Some Suggestions for Structural Design to Allow Low-cost Welding

by David W. Dickie, N.A.

The research necessary to produce these articles shows plainly that if warping of the finished ship from welding shrinkage is to be avoided the use of the riveted hull design should be discontinued and a new hull design be made that is especially suitable for welded structures. In some cases distortion stresses have been so great that the bow and stern of the ship have lifted off the building blocks so the keel was not straight. Tram points are used to record the movement as the work progresses and attempts are made to correct distortion by control of the welding procedure; whereas by changing the design so that the welding draws equally, practically all of these troubles can be avoided.

Sheer

In laying off the decks, the sheer of the top of the side plating should be faired to fit the freeboard rules to preserve the appearance of the welded ship, but in a cargo ship the decks can be made straight from bulkhead to bulkhead, retaining the sheer points at each bulkhead. This procedure simplifies assembling the beams to the deck plating at an angle so the brackets will hang vertical when erected in the ship.

Duplex Welding Heads

Much of the machine welding of a ship can be done more efficiently with duplex welding heads using less heat, less current, and smaller welding wire, accomplishing the work faster and with less distortion and shrinkage. Items like stiffeners to floors, floors to inner bottom, stiffeners to bulkheads, beams to decks, flanges to brackets, all lend themselves to duplex welding.

Attachment Thicknesses

In all cases where connection is to be made at approximate right angle between sections of different thicknesses, the rule of welding the thin section to the thick section should be followed. Experience has shown that where this rule has not been adhered to excessive distortion has resulted. For example, in small vessels if the shell plating is made thicker than actually necessary, the frames can be of wider spacing and with webs thinner than the shell.

The reason is that a large body of heated metal exerts a greater shrinkage force in cooling than a small body, the latter distorts when it yields to the strain.

Scantlings

Some changes in scantlings should be made in a welded ship as they affect the welding practice. As shown in the midship section in the March article of the PACIFIC MARINE REVIEW, the deep frames were carried up to the second deck because the American Bureau Rules call for it. No doubt, if the Bureau had been consulted, the frames in the lower tween deck could have been made 12½″ instead of 15½″ and the frames in the upper tween deck 10½″ instead of 12½″.

The bulkhead design is even more interesting in that one of the connections of a welded bulkhead is weaker and the others are stronger than a riveted bulkhead if the scantlings are taken from the riveted bulkhead design.

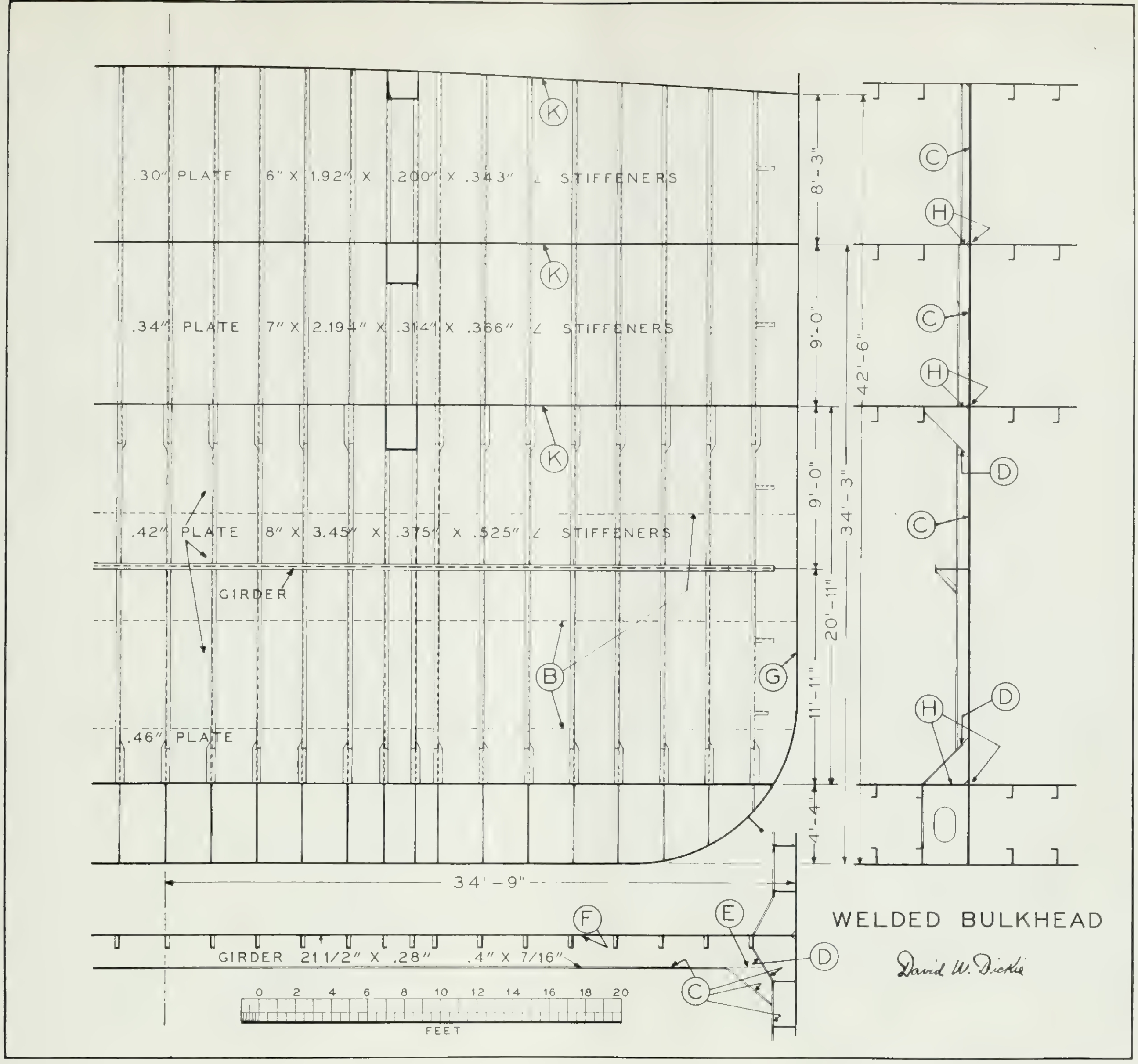
A riveted bulkhead in the hold has a double riveted bounding bar attachment to the side plating which adds stiffness to the structure against lateral deflection even though the metal connection of the rivets is much weaker than the welded connection of the bulkhead plate to the side plating. Testing models to destruction indicates that a wise precaution would be to attach the outboard stiffener of the welded bulkhead to the adjacent frame on each side with light struts spaced at intervals of about 4′6″, as a substitute for brackets which are difficult to weld after the structure is assembled on account of the shrinkage.

On the other hand, the stiffeners of a riveted bulkhead in the upper tween deck may depend solely on the standing flange of an angle as the only support. When an angle is attached to the bulkhead plate by the toe of the long flange, as in a welded bulkhead, it virtually becomes a channel with one flange hidden in the plate of the bulkhead.

Also, unbracketed stiffeners of a riveted bulkhead in the upper tween deck may be 5½″ x 3″ x .32″ bulb angles of which the section modulus is 3.7 inches cubed. If a 6″x1.92″x.200″ x.343″ channel with one flange sheared off at the mill is substituted on the welded bulkhead, the section modulus is 4.3 inches cubed and the saving in weight is 40 per cent. This adheres to the rule of keeping the web (.200″) thinner than the plate (.30″) to which it is to be welded.

If we assume the stiffeners in the lower tween deck are clipped to save expense, a riveted bulkhead would have 7″ x 3″ x .32″ bulb angles, the section modulus about the axis parallel to the bulkhead being 6.5 inches cubed. An equivalent channel with one flange concealed in the plate of the bulkhead would be 7″ x 2.194″ x .314″ x .316″ the section modulus being 6.9 inches cubed or a 6″ x 3″ x .313″ x .475″ channel with a section modulus of 8.2 inches cubed.

However, welding the toe of a 6″ x 3½″ x 3½″ x 5/16″ angle to the bulkhead to form the nearest equivalent section with the duplex synchro-tie welding heads is awkward, but it can


.30″ PLATE 6″ X 1.92″ X .200″ X .343″ ∠ STIFFENERS
.34″ PLATE 7″ X 2.194″ X .314″ X .366″ ∠ STIFFENERS
.42″ PLATE 8″ X 3.45″ X .375″ X .525″ ∠ STIFFENERS
GIRDER
.46″ PLATE
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D
8′-3″
9′-0″
9′-0″
11′-11″
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42′-6″
34′-3″
20′-11″
34′-9″
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E
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GIRDER 21 1/2″ X .28″ .4″ X 7/16″
0 2 4 6 8 10 12 14 16 18 20
FEET
WELDED BULKHEAD
David W. Dickie

be done using the single pass Unionmelt method. A better solution is the 7″ x 2.194″ x .314″ x .366″ channel with one flange sheared off at the mill. The saving in weight substituting for the 7″ x 3″ x .32″ bulb angle is 20 per cent. Here again the web (.314″) is thinner than the plate (.34″) to which it is attached. In time, the mills will roll what can be termed welding angles instead of the present angles, bulb angles and channels that are designed for riveted structures.

Welding Procedure

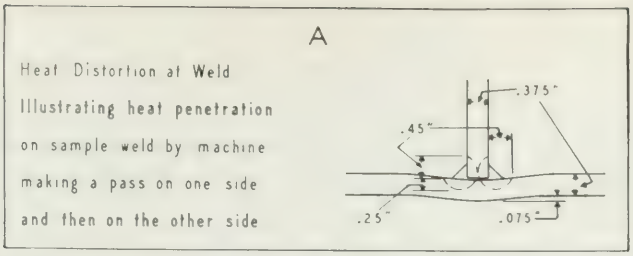
The plating of a typical bulkhead lends itself to a particular welding procedure due to the fact that one side is a plane and remains a plane when erected in the ship. Part of the inner bottom plating can be assembled in the same way.

Place the square ends of the plates without beveling together butt to butt over the I beams on the welding rack. In some cases it is advisable to have the line of the butt about 1/8″ concaved instead of straight to help with the buckling. Make a pass on top with the welding head using a welding wire not over 4/32″ or 5/32″ diameter. The slag and flux will deposit at the butts between the weld and the I beam. Turn the plate over, burn the butt with a hook burner or gouging tool to get rid of the flux and slag. Make a pass with the welding head penetrating into the previous weld. For plates 3/8″ or over, it may be advisable to make two passes to complete the weld to save changing the size of the welding wire.

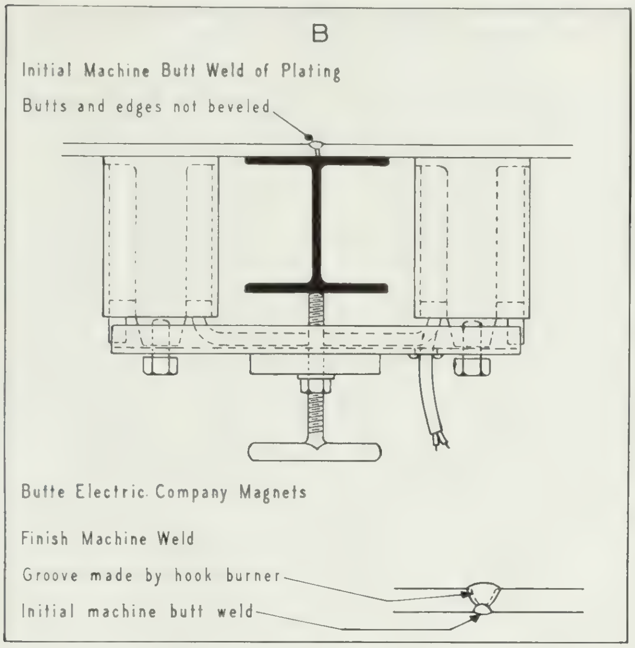
Place the edges of the long plates together over the I beams on the welding rack and repeat the operation as above. Turn the bulkhead over and make the finish weld of the seams, placing the I beams with a series of graduated rollers off the seams of the plating so the top surface will be a plane. The rollers are put in by raising the plate with an air jack. If the seams are arranged vertically one operation can be eliminated by using plates 8 or 9 feet wide and keeping the edges a little concave.

On the initial pass, the I beams must be placed close together butt to butt under the seam or the welding will blow through the gap between the ends of the I beams. The I beams can be either 5″ x 3″ x 10 pounds or 5″ x 5″ x 13.5 pounds but the flange must be wide enough to prevent the initial weld from blowing down through the seam and out at the side between the I beam and the plate.

The plates are usually held down by weights which interfere with the ef-


A

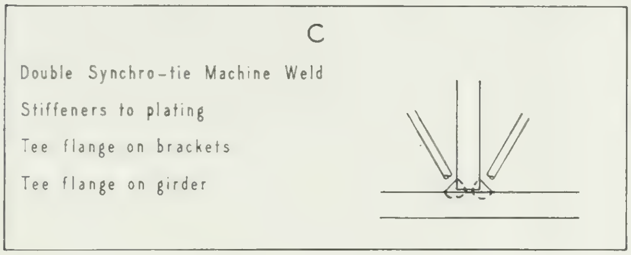
Heat Distortion at Weld
Illustrating heat penetration on sample weld by machine making a pass on one side and then on the other side


B

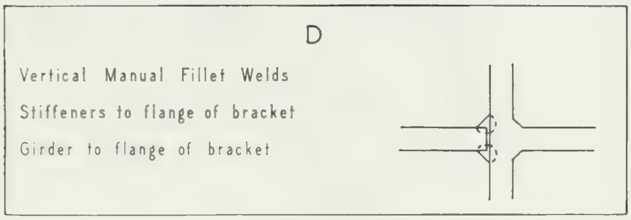
Initial Machine Butt Weld of Plating
Butts and edges not beveled

Butte Electric Company Magnets

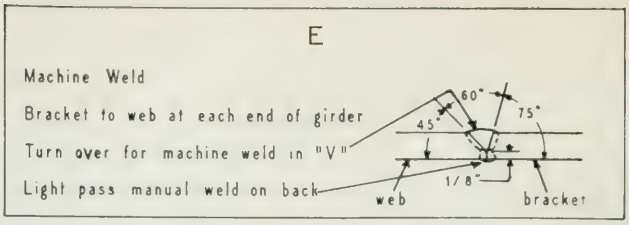
Finish Machine Weld
Groove made by hook burner
Initial machine butt weld


C

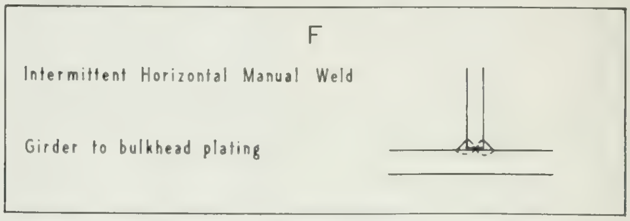
Double Synchro-tie Machine Weld
Stiffeners to plating
Tee flange on brackets
Tee flange on girder


D

Vertical Manual Fillet Welds
Stiffeners to flange of bracket
Girder to flange of bracket

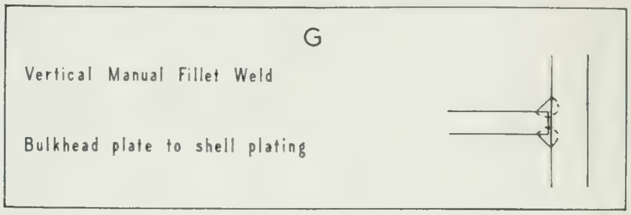

E

Machine Weld
Bracket to web at each end of girder
Turn over for machine weld in "V"
Light pass manual weld on back


F

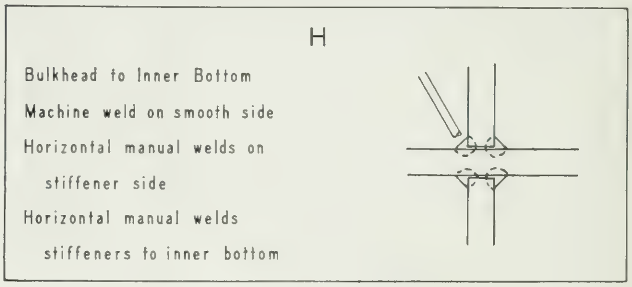
Intermittent Horizontal Manual Weld

Girder to bulkhead plating

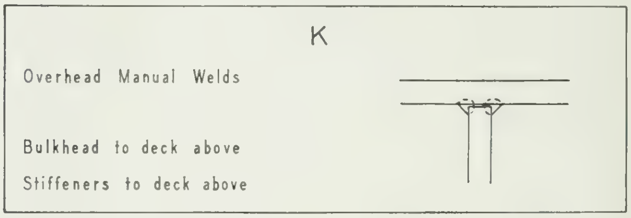

G

Vertical Manual Fillet Weld

Bulkhead plate to shell plating


H

Bulkhead to Inner Bottom
Machine weld on smooth side
Horizontal manual welds on stiffener side
Horizontal manual welds stiffeners to inner bottom


K

Overhead Manual Welds

Bulkhead to deck above
Stiffeners to deck above

WELDING ANNOTATION

David W. Dickie

ficient operation of the welding head and are too heavy to handle when of adequate weight. A better way is to use the magnets of the Butte Electric and Manufacturing Co. which have a coil on each side of the I beam with a thumb screw in the center of the yoke. The thumb screw is tightened up against the bottom of the I beam holding the plates down firmly against it. The current for the magnets comes from a 6 volt automobile storage battery, which is recharged as necessary. A piece of sheet iron is placed between the magnet and the I beam to keep possible sparks from contacting the shell of the magnet. It stays in place due to the magnetic attraction.

Some research is advisable to develop a method of cooling that will serve to correct the buckling of the large sheet. Water is objectionable on account of its effect on a succeeding welding operation. Compressed air is expensive and has to be dehydrated in foggy weather.

Stiffeners

The stiffeners of the lower part of the bulkhead are 8″ x 3.45″ x .375″ x .525″ channels with one flange sheared off at the mill. The web (.375″) is welded to the plate (.42″). They are shown 30″ spacing to conform with the midship section as shown in the March Pacific Marine Review article, which has a center line and side girders in the double bottom. By changing the spacing from 30″ to 32″, the thickness of the plating is increased a little but fewer stiffeners are required, which helps to overcome the effect of shrinkage and makes a saving in weight of about 8.2 per cent. However, the bulkhead is about 4 per cent heavier if the stiffeners are increased to 36″ spacing. The 32″ spacing lends itself better to the use of a center line tunnel in the double bottom to house the piping and electric conduits.

The stiffener brackets are cut to shape. Each end of the stiffener is burned across at 45 degrees and manually welded to the bracket top and bottom. The Tee flanges of the brackets are burned to a taper to clear the duplex welding heads of the assembly operation of welding the stiffener to the bulkhead plating.

The usual fillets for attaching the stiffeners to the bulkhead are ¼″ on each side when made by the duplex machine. As the thickness of the web of the stiffener on the hold part of the bulkhead is .375″, the use of fillets greater than 3/16″ is unnecessary from a strength point of view. These can be made by changing to a smaller welding wire.

With stiffeners spaced 30″ centers, the thickness of the plates of a riveted bulkhead are .48″ up to 3 feet and .42″, .39″ and .36″ respectively the remainder of the way up to the lowest deck. When shrinkage is considered, it is better to make the welded bulkhead plating the same thickness (.42″) from the plate above the inner bottom up to the lowest deck. This adds ¾ of a ton of unnecessary weight but does equalize the shrinkage throughout the length of the stiffeners. The other parts of the bulkhead are the same thickness between decks.

Shrinkage

The shrinkage coefficient for the .42″ plate is 11.5%, .39″ plate 12.5% and for the .36″plate 13.5% .These are averages of the current welding practice and the etched sections show from 30% to 50% heat penetration with the weld penetration somewhat less.

Using ¼″ fillets; 29 stiffeners x 2 x ¼″=14.5″ weld metal across the bulkhead. 14.5″ x 13.5%=1.957″ shrinkage; 14.5″ x 12.5%=1.812″ shrinkage and 14.5″ x 11.5%=1.667″ shrinkage. The difference between 1.957 and 1.667 inches shrinkage across the bulkhead is .29″. If a hole is cut in the top plate of the bulkhead of the correct size and location, the top plate splits vertically to relieve the strain set up by the shrinkage.

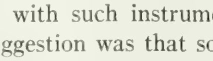
Similarly using 3/16″ fillets, 29 stiffeners x 2 x 3/16″=10.875″ of weld metal across the bulkhead. 10.875″ x 13.5%=1.468″, 10.875″ x 12.5%=1.359″ and 10.875″ x 11.5% =1.251″ shrinkage. The difference between 1.468″ and 1.251″=.217″ a little less than when ¼″ fillets are used.

If we change to 32″ spacing, let the center line of the bulkhead come between two stiffeners and use a tunnel in the double bottom, we have 26 stiffeners. Using 3/16″ fillets, 26 stiffeners x 2 x 3/16″=9.75″ of weld metal across the bulkhead. 9.75″ x 13.5%= 1.316″, 9.75″ x 12.5%=1.219″ and 9.75″ x 11.5%=1.121″ shrinkage. The difference across the bulkhead is reduced to .195″ but still not good enough which explains the suggestion for making the bulkhead plates the same thickness up to the lower deck.

The welding samples having ⅜″ fillets show the heat penetration (not the weld penetration) to be according to the lines on Sketch "A" on the annotation sheet and the plate buckles when the weld cools as shown by the dimension on the face of the bulkhead plate opposite the stiffener. This accounts for the difference in shrinkage between the thick and the thin plates as the buckle is larger on the thin plate due to the same welding heat being used throughout the length of the stiffener.

The excessive distortion was caused by specifying the fillet too large for the thickness of the plates being attached. A little less distortion would have resulted from a weave technique manual weld but there is no justification for the oversize fillet with either a machine or manual weld.

If the plate of the bulkhead is heated red hot clear through at each stiffener during the welding operation, the rollers will permit free athwartship expansion and contraction of the bulkhead plate and all strains will be relieved. The welding research workers suggest such procedure will require that the plate temperatures be indicated by a pyrometer and there are no welders in the field that have had experience with such instruments. Another suggestion was that some practical means of application of a cold air blast could be worked out to draw the heat away from the back of the plating and prevent the formation of the buckle at the stiffener.



All of the research workers are agreed that if the least possible heat is used to accomplish the purpose, the finished work will be better which confirms the advisability of using duplex welding heads.

Weight of the Bulkhead

The calculated weight of the riveted and welded bulkheads shows that the latter is lighter as follows:

Part in the upper tween deck: 22% lighter. Part in lower tween deck: 16% lighter. Part in the hold when the plating is made constant thickness up to the lower deck: 8% lighter. Aggregate of all three parts: 12% lighter.

Brackets

The brackets for the stiffeners, girders, etc., are formed by fastening the flange to the welding table and tacking the web plate vertically to it. The duplex welding head makes a fillet on each side of the vertical plate forming a Tee flange. The brackets are then cut to fit the location in the ship.

Transverse Girder

The transverse girder is made the same way as the bracket assembly. The girder and two brackets are assembled on the welding rack over an I beam or a down hand manual weld is made in the bottom of the V and the seam machine welded. The girder is turned over, the seam cleaned with a gouging tool and the weld finished by machine.

The slots for the stiffeners are burned in the girder and the attachment to the plating and stiffeners of the bulkhead made by manual welding. The steadying struts are welded in place while the bulkhead is on the rack as the final operation.

Placing the Bulkhead

After the stiffeners and transverse girder are welded to the bulkhead, it is trimmed to template on the bottom and sides and lifted to place. One crane, of the size given in the March article, will lift the bulkhead. The fillet weld to the inner bottom on the smooth side is made by machine and the fillet welds connecting the bulkhead plate and the brackets to the inner bottom on the other side made manually.

Weight Lifting Specialists

●

This sequence of snaps taken by our staff photographer shows the Haviside derrick barge No. 4 lifting and spotting on barges large sections of fabricated steel foundation forms weighing 65 tons each

●

Along the San Francisco waterfront, whenever heavy and unusual lifts are to be made, the name Haviside always springs quite naturally into prominence. The Haviside Company own the largest commercial, heavy-lifting barges on the Pacific Coast and have had longer and larger experience in this type of work than any other Pacific Coast organization.

A very good example of the type of heavy lifting in which this firm excels was witnessed recently in the moving of several large and heavy fabricated steel sections for the base foundations of the new graving dock at Mare Island.

Gerwick Wood Company, the contractor on the drydock work, had built these sections at San Francisco. Each section weighed 65 tons and was bulky

Byron (Tote) and Harry Haviside

enough to make safe slinging a problem.

U. S. Steel Monitor brand 1½-inch 8 x 19 plow steel rope was chosen for the slings. Four 60-foot lengths of this rope were used to make the four-leg sling. Each leg was attached to the section through a steel eye pad welded to the steel work. The position of the pads and the length of the sling legs were carefully calculated to make sure that the distortion strains on the section would be at the practical minimum.

On account of the weight and bulk of the pieces, the contractors' barge had to be carefully blocked and the sections spotted on these blocks with extreme care and accuracy. Haviside Barge No. 4 and the tug H. S. Haviside performed this operation without a hitch, as shown in the pictures herewith.

All wire on the job—slings, falls, towing rope—was of U. S. Steel manufacture. All tackle blocks were made up specially by Haviside. This guarantees safety in rope work. In working under Haviside tackle, straight time or overtime, day or night, the men have no fear and can do better work.

Expert observers were Captain Parker of S. F. Bar pilots and Captain Dean

Todd Shipyards Corporation

(Continued from page 37)

Maritime Commission contracts for the construction of 175 vessels, which brings the total number of vessels built or to be built in all shipbuilding plants to 306.

"The contracts for most of these vessels were offered and accepted upon a very moderate fixed-fee basis. It follows that, because of the restricted margin of profit and the high income and excess profits tax rates to be in effect over the period in which the vessels are to be constructed, the return from this special work will be small in comparison with the volume of work, so that this business should be regarded as a part of your company's contribution toward the National Defense Program than as a source of large profit.

Magnesium Plant

"As a further contribution to National Defense, and having received from the United States Government a Certificate of Necessity, Todd-California Shipbuilding Corporation consented to investing the anticipated profits from its fixed-fee shipbuilding contract, in a new plant for the production of magnesium and its products. For the establishment of this magnesium plant, the Reconstruction Finance Corporation has approved a loan of $3,500,000 for the development of a preliminary unit which will be located at Permanente, California."

This concise and lucid statement shows clearly that: no large profits are to be expected from this huge volume of business; that the organization and the location of this far-flung group of new shipyards has been very carefully worked out; and that the American shipbuilding industry as represented by the Todd organization is ready and willing to meet the demands of the national emergency with an "all out" program of ship production.

Pacific Coast Shipbuilding School

San Francisco Bay region is evidencing a very sharp demand for skilled shipbuilding labor at the many busy shipyards in that area. One of the most successful efforts to meet this need is the Pacific Coast Shipbuilding School.

Starting in February of this year, the school announced three months intensive training courses for ship fitters. It now has over 200 students enrolled.

Graduating exercises for the first class were held Sunday, May 25, on the floor of the San Francisco Maritime Exchange. Fifty-six young men matriculated, all of whom are going right into shipyard work and many of whom were already working in the yards before graduation.

Joseph F. Marias, president of the State Board of Harbor Commissioners for San Francisco, delivered a spirited baccalaureate address. R. S. Turner, president of the Foreign Trade Association, was chairman and H. M. Peterson, chaplain of the U. S. Navy, invoked divine blessing.

The faculty of this institution includes:

L. T. Taylor, director.

Gus. Esse, chief loftsman, Bethlehem Steel Company, San Francisco.

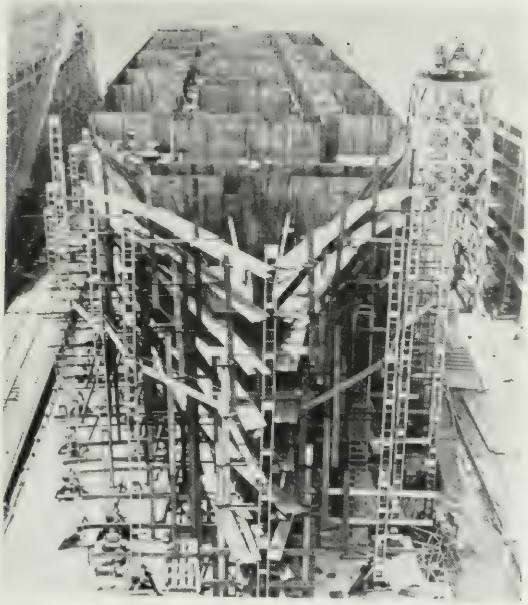
A. Mori, chief loftsman, Todd-California Shipbuilding Company, San Francisco.

Victor Christensen, hull completion foreman, Bethlehem Steel Company, San Francisco.

W. F. Holmes, night superintendent, Bethlehem Steel Company, San Francisco.

Louis Mathis, production engineer, Western Pipe & Steel Company, South San Francisco.

A. W. Tate, chief draftsman, Western Pipe and Steel Company, South San Francisco.



Above is shown the all-welded passenger liner, African Comet, under construction

First All-Welded Passenger Liners

In the famous American Clipper ship days, Pascagoula, county seat of Jackson, Mississippi, was well known to American shipbuilders.

Longfellow in his famous poem "The Building of the Ship" sees lying around in an East Boston shipyard the "gnarled and crooked cedar knees from regions remote and far away, from Pascagoula's sunny bay or the banks of the roaring Roanoke."

For generations Pascagoula has maintained saw mills, wooden boat and shipbuilding and repair yards.

Today the Ingalls Shipbuilding Corporation is making steel shipbuilding history on the banks of the "singing" river that gives its name to the city.

Fifty-six feet above the keel of the first all-welded passenger ship in the world at the Pascagoula yard of the Ingalls Shipbuilding Corporation, a swarm of men is working day and night erecting the cabin bulkheads on the shelter deck of what soon will be christened the African Comet. And as the bulkheads rise in the flare of scores of welding arcs, staterooms and their private baths rapidly take shape to accommodate the 116 passengers which the African Comet will carry.

Work on this new vessel and her two sister ships is progressing so rapidly on the banks of the Pascagoula River that the African Comet is expected to be launched in late June as the first of three new $4,000,000 ships for the American South African Line. Realignment of space on the shelter deck, now nearly completed at the Ingalls shipyard, provides cabin-class accom-

Below is a general view of the Ingalls yard at Pascagoula, showing the three American-South African Line ships

modations for 116 passengers instead of the 111 originally announced. The superstructure, which will be erected above the shelter deck, will house all the public rooms and accommodations for officers. There wlil be three decks in this erection—the promenade deck, the boat deck and the bridge deck.

The new liners will not have a rivet in them. Their smooth, all-welded hulls and interiors present a striking streamlined appearance, which helps increase their speed and saves weight. The ships, all of which will be in service this year, will reach Capetown 16½ days out of New York, establishing a new record for regularly scheduled passenger service between these two ports.

The framework of the outdoor, tiled swimming pool, which will be one of the many unusual features of the new ships linking the United States to 10 ports of South and East Africa, is already in place on the African Comet. Every cabin—and all are on the outside—has had its bulkheads installed, with ample space for either a private bath or shower. Inquiries from travel agents, as well as private individuals, point to a heavy demand for space when the ships enter service.

These steel bulkheads, which appear somewhat like an ancient city uncovered by an archaeologist, will soon be blossoming out as beautifully-finished and superbly-equipped bedrooms with bath on the passenger liner African Comet

U. S. Navy Department Needs Many Inspectors

For Ship Construction

An effort is being made by the U. S. Civil Service Commission to meet the demand for inspectors of ship construction and engineering materials in the Navy Department. New examinations for these positions, with modified requirements, have just been announced. Announcement No. 81 for Inspector of Engineering Materials and Announcement No. 82 for Inspector of Ship Construction cancel and supersede Announcement No. 103 of 1940, the original announcement of the examinations for these positions. Persons qualified under the new examinations are urged to file application at once, although applications will be accepted at the Commission's Washington office until further notice.

The Inspector of Engineering Materials positions pay from $1,620 to $2,600 a year and persons may qualify in the following optional branches: Steel hulls, mechanical, electrical, and radio. Although experience in the inspection or testing of engineering materials in the optional branches is required, applicants for the junior, assistant and associate grades will not be limited to any specific optional branch. Substitution of mechanical or other related types of experience, or of appropriate education, may be made for a part—or for some grades, all—of this inspectional experience. Except for the positions of junior inspector for which the maximum age is 35 years, applicants must not have passed their sixty-fifth birthday.

Inspector of Ship Construction positions pay from $2,000 to $2,600 a year. There are four optional branches of inspection: Electrical, mechanical, steel hulls, and wood hulls. Experience in testing or inspection construction or installation work is required, but for a part—or for some positions, all—of this experience applicants may substitute mechanical or other related types of experience, appropriate education or possession of a marine engineer's license. The maximum age limit is 65 years.

The duties to be performed by inspectors of engineering materials and ship construction involve testing and inspecting the type of marine construction, or construction materials, indicated by the optional branches. Inspectors will also read drawings and interpret specifications, as well as make inspection reports and conduct correspondence.

The formal announcements give the complete requirements, including the specific types of substitutions that may be made for the inspectional experience. Persons who are interested are urged to apply for further information and application forms to any first- or second-class post office, or to the Civil Service Commission.

News FROM THE PACIFIC NORTHWEST

by Daniel L. Pratt

As of May 15th

A Modern Yacht Shelter

The Puget Sound customs district has over 18,000 registered or numbered small boats, being second in this respect only to New York. The majority of these designate their home port as Seattle, and although that city boasts of a salt and fresh water harbor front of over 170 lineal miles, so much of this is taken up with commercial development that the problem of taking care of its small craft fleet is growing more and more acute.

It was because of this latter fact that O. D. Fisher, prominent Seattle flour miller, having built a handsome new yacht, conceived the idea of creating a complete, modern covered yacht harbor. Today this project is a reality, for on April 25 the Marina Mart, Inc., was opened at the southeast corner of Lake Union within a mile of Seattle's business center.

Marina Mart occupies 400 feet of waterfront at 1500 Westlake Ave. North, one of the arterial avenues leading north from the business district. It consists of two structures, the main building with covered moorings behind it, with a frontage of 250 feet and three stories high, and the Boat Sales Department building, 50 x 150 feet, two stories high. In front of these two structures is parking space for over 400 automobiles. Behind are sheltered mooring spaces for 52 yachts and open moorings for twelve more.

The main building is a unique structure not only because of its front elevation and central tower, all finished in exterior Douglas fir plywood and painted white, but also because its interior contains departments that provide for every possible need for the boat owner. These include a complete grocery store, seafood cafe, sporting good store, yacht clothing and furniture, and marine supplies of all kinds.

In the three-day opening of the Marina, starting on April 25, over 35.000 people attended and over 40 of the yacht stalls were rented. There was every evidence that the Marina Mart, Inc., was an assured success. Officers of the operating company are: George F. Warren, president, and Roy W. Corbett, vice president and sales manager, both well-known Seattle yachtsmen.

Ships Launched and New Keels Laid

While the grading crews have been busy at the Tacoma plant of the Seattle-Tacoma Shipbuilding Corp., clearing the site for eight additional ways, the fourth of the C-1 type ships, the M. S. Fairweather, has been launched, and is being rushed to completion along with her sister motorships, Cape Flattery and Cape Cleare. The Cape Flattery is practically completed and is scheduled for delivery to her operators, the American Mail Line of Seattle, about June 1. Cape Alava, the first of the five C-1s completed, is now in the Oriental service of the American Mail.

Meanwhile, the builders have announced the laying of Keel No. 6, first of a new series of six C-3 steamers they will construct. It is understood that the first two of these will be Army carriers, single day's receipt since the first of the first of the five Navy tankers will be started as soon as the new ways are available.

Voluntary Cut In Profits

It is not often that a shipbuilder offers to share his profits with the Government — if he has any — except through due processes of income tax, so the U. S. Navy was perhaps pleasantly surprised when the Associated Shipbuilders, Inc., of Seattle recently offered an equitable settlement of profit on the $1,750,000 contract for the conversion of the City of Newport News into the Navy transport Fuller. After the final audit has been made, a sizable amount will be returned to the Navy Department.

The conversion job on the Fuller was done at the plant of the Lake Union Drydock & Machine Works, Seattle, which is associated with the Puget Sound Bridge & Dredging Co. in the new Associated Shipbuilders, Inc. This company has received orders to build four seaplane tenders at a cost of $18,000,000, the construction of which is ready to start at a new plant on Harbor Island.

First New Minesweeper Delivered

The first week in May, the first of

the new minesweepers, the U. S. S. Phoebe, was commissioned and delivered to the Navy by its builders, the Western Boat Building Co. of Tacoma. The vessel was accepted for the Navy by its commanding officer, Lieut. John Parish. . . . Martin Petrich, president of the Western Boat Co., has announced the building of a new plant on the Tacoma tidelands capable of constructing either steel or wooden ships up to 250 feet in length.

Another minesweeper was launched in Tacoma from the ways of the Peterson Shipbuilding Co., 90 days after contract was let to John Breskovich.

The covered berths of Seattle's new "Marina Mart" provide for 52 pleasure craft

Black Ball Adds To Its Ferry Fleet

Puget Sound Navigation Co. (Black Ball Line) of Seattle, has made another huge addition to its fleet by the purchase of the five remaining ferries of Southern Pacific's Golden Gate fleet, formerly operated on San Francisco Bay. This brings the total of ferries purchased by this company at San Francisco to 17, six having been acquired in November, 1937, six in July, 1940. All of these latter boats are now in Seattle with the exception of one of the first six, wrecked on its way up the coast under tow, and another, not considered desirable for Puget Sound service, sold to other interests. Vessels taken over in the latest deal are all steel and steam-operated, though some of these will probably be converted to diesel later, in keeping with the company policy. Vessels acquired are: City of Sacramento and Calistoga, single-end craft 300 feet in length; Napa, single-end, 242 feet overall, and Shasta and San Mateo, each 240 feet overall, double-ended. At least two of these boats are needed on Puget Sound at once, and disposition will be announced of the others later. Purchase of the last five boats makes a total fleet of 24 ferries, 15 of which are now operating, four to be put into service within a month. Already, opposite the fast ferries Kalakala and Chippewa, taking the place of a slower ferry that has been on the run between Seattle and Bremerton, Black Ball has put into service the fast remodeled Willapa, formerly the Fresno, 256 feet long, which, with her new 2,900 hp Busch-Sulzer diesel, has a speed expected to equal the Kalakala, heretofore considered the fastest in the country. Before this is published, her sister ship Enetai, of equal speed, will join her. These four vessels will enable the Black Ball to make thirty round trips a day on this important route.

Navy Adds New Ferry To Bainbridge Service

The Shain Manufacturing Co.'s yard at Seattle has completed for the Navy a new 64-foot ferry that will operate between the Bremerton Navy Yard and the new Naval radio stations on Bainbridge Island. The boat will make about 15 mph with her twin Buda 140 hp diesel engines and can handle 150 passengers. Another deck can be added to the present design should further passenger travel be needed.

Bulk Oil For Alaska Ports

News of very great import to operators of boats in Alaska waters is contained in the announcement by the Standard Oil Co. of California of bulk delivery of oil to the Aleutian Islands and Bering seaports and the completion of storage tanks at important points to better serve the needs of the marine field and of the mining, fishing and other industries. First bargeload of gasoline and lubricating oils was on its way north on May 1. The barge has a capacity of 320,000 gallons and was towed by the tug Edith Foss. This is the first trip of this kind ever made.

Bulk storage tanks constructed by Standard Oil Company of California at central stations such as Dutch Harbor, Platinum, Bethel and Nome, together with a commercial barge delivery service will bring bulk distribution to an area that heretofore was dependent upon supplies shipped in steel drums and cases.

Marine Shorts

Despite the reduction in world markets due to the European war, waterborne shipments of lumber from the Pacific Northwest during the first quarter of 1941 were 962,176,000 feet, only slightly lower than those of a year ago.

* * *

The Navy Department has asked Congress for legislation officially establishing the Puget Sound Navy fuel depot at Orchard Point and Middle Point, near the east entrance to Rich Passage. Construction of necessary oil storage facilities, buildings and steel and concrete piers was started last fall under an allotment of $1,500,000 and under supervision of the Austin Co.

* * *

Puget Sound tugboats, fishing vessels and pleasure craft have been invited to the Young Men's Business Club of Tacoma to take part in the fourth annual water carnival to be sponsored by them on June 15. **Hervey Petrich** of the **Western Boat Building Co.** is chairman of the committee. The theme this year will be Tacoma's contribution to marine defense.

* * *

The **Bremerton Navy Yard** is launching two new navy seaplane tenders, the Barnegat and Biscayne, on May 23. Both vessels will be commissioned and christened July 3, but the Barnegat will not be completed until August 9 and the other vessel until September 15. They are considered by naval officers as the finest of their type ever built as they include in their design and construction the latest developments for boats of their type. Due to the enormous volume of work on hand at Bremerton, the pay roll is constantly increasing, and it was estimated by May 1, 13,000 men were employed there, not counting the 700 men employed as relief workers.

* * *

The keel for the first of a fleet of 9,300-ton cargo ships ordered by the British Admiralty was laid in April at the **Burrard Drydock Co.'s** plant at Vancouver, B. C. It was the first steel cargo ship laid down there in 20 years. At the same time dredges commenced clearing a channel in front of four new ways to be built by the company across from the present plant.

* * *

The seagoing tug **Meteor,** owned by **Frank P. Williams** of Seattle, left the first week in May with a 120-foot welded steel barge in tow for the Kuskukwim River, Alaska. The barge, designed by H. C. Hanson, was built by the Reliable Welding Works of Olympia for the Rivers Navigation Co. and will haul oil to storage tanks along the river from Bethel.

* * *

Opening a new freight service between Seattle, Cook Inlet and other Southwestern Alaska ports, the newly fitted and rebuilt motorship Western Trader has gone into operation for the Western Shipping Co., Pier 4, Seattle. With new refrigeration space of 270 tons, two new 220 hp Atlas diesels, the 128-foot boat has a gross tonnage of 328. She was purchased some time ago from Capt. Harry Crosby. Officers of the Western Trading Co. are H. A. Featherstone of the Fruit Delivery Co., president; Wallace Bailey, vice president and manager; and Guy Fitch, secretary and treasurer.

Short Shorts

Austin Co. have started work on a $225,000 naval section base on Ediz Hook, harbor of Port Angeles.

Oregon Board of Pilot Commissioners ruled May 13 that although defective steering gear was mainly responsible for grounding and loss of the Russian freighter **Vazlav Vorovsky,** negligence of Pilot **George Conway** also contributed, and suspended his license for two months.

Congressman **Warren G. Magnuson** advocates legislation to enable the Navy to sell naval equipment to the Philippine Commonwealth, at least enough to be suitable for a small offshore patrol.

The four-masted steel bark **Daylight,** at one time operated in the coastwise trade by James Griffiths & Sons, but idle for a number of years at their Winslow yard, was towed northward recently by the tug Neptune to be recommissioned for service of an unannounced nature. She is said to have been one of the largest sailing vessels ever built and is 351 feet long.

The N. Y. K. motor liner Hikawa Maru arriving at Seattle recently was the first vessel of this line for a number of years to call at Port Angeles for inspection and come to Seattle direct instead of making Vancouver first. The quarantine station has been moved to Port Angeles from Port Townsend during the defense emergency.

West Kyska of the Arrow Line arrived at Seattle May 3 with a 1,000-ton gold dredge for the **American Smelting & Refining Co.'s** operations at Nome, Alaska. The dredge was shipped knocked-down and will go north on one of the **Alaska S. S. Co.'s** liners.

Gateway City arrived on Puget Sound late in May and is now on the Oriental run under the Arrow Line.

Shortage of ships may force many Northwest lumber mills to close. **Pope & Talbot** and **McCormick S. S. Co.** have already warned that if additional ships are removed from the intercoastal service, production will be curtailed within 90 days. **Grays Harbor** mills have already been affected, and **R. V. Stewart,** secretary of the British Columbia Loggers' Association, states that large logging operations in the Vancouver district have been closed.

Willamette Iron & Steel and Commercial Iron Works submitted bids May 15 for repairs on the sabotaged Italian motorship Leme now in possession of the Coast Guard.

Skagit River Navigation Co. is building a new 200-foot stern-wheeler at Everett to be named the Seavern, to take the place of the recently sunk Gleaner.

Personal Gleanings

As part of the observance of National Foreign Trade Week, the Seattle Transportation Club held a special luncheon at which **E. V. Illsey,** manager of the Canadian Bank of Commerce, spoke on "The Significance of Our Foreign Trade." . . . Capt. **Lawrence Parks** of the Alaska Transportation Co. is now Lieut. Lawrence Parks, having been called into service as a naval reservist. . . . **Geo. C. Howard,** until recently U. S. Commercial attache to Sweden, was the principal speaker at a meeting of the Seattle Industrial Traffic Managers' Association May 13. . . . Puget Sound naval reservists called for training at San Diego are making good, according to **B. D. Riley,** manager of the Merchants' Exchange, who recently heard the facts from his son Thomas, who went south from this district. . . . **Capt. Chas. S. Carlson,** captain of the steamship North Pacific, when he sailed on his vessel May 15, was on his fiftieth round trip voyage to Bethel and the Kuskoquim River. . . . **Capt. Harry C. Roach,** formerly of the New York district of the Coast Guard, has arrived in Seattle to take over duties here as engineering captain for this district. He replaces **Capt. Geo. W. David** who is retiring from service. . . . Seattle Traffic Managers Association have elected new officers as follows: **Van Donaldson,** president; **F. W. Fuller,** vice president; **J. L. Young,** secretary-treasurer; **Ralph Turman, K. A. Knudson** and **F. G. Frederick,** trustees. . . . **Harry W. Hitchcock,** representative of OPM, Washington, D. C., spent last month in the Puget Sound area on an inspection tour. . . . **Lieut. Commander M. P. Jensen,** formerly a resident of Seattle, has been designated by the Coast Guard as port captain for the Oregon waters. . . . **Commander C. W. Eshom,** who has been traffic manager for the Blue Star Line in Seattle since 1929, has been ordered to active service in command of the U. S. S. Tatoosh, which will soon be commissioned at Bremerton as a Navy supply, repair and patrol ship. . . . **Dietrich Schmitz,** president of the Washington Mutual Savings Bank of Seattle and a prominent yachtsman, represented Governor Langlie of Washington at the launching of the mighty 35,000-ton battleship Washington at Philadelphia.

News FROM THE PACIFIC SOUTHWEST

by K. M. Walker

As of May 15th

Gambling Ship To Be Six Master

In the last issue it was reported that the gambling barge Rex, now being stripped of her ungainly deck house at Newport Beach, is to be converted to a five masted schooner. The owners have now decided to add another mast, thus reducing the individual sail area for easier handling, and rig her with all jib headed sails to eliminate all gaffs, peak halliards and other top hamper. A seventy-six foot yard on the foremast will carry a three cornered "Raffy" sail eighty-five feet in height and having a single tack amidships. The halliards on each mast will run over the top of the mast and will be a single wire pennant led to a crab winch bolted to the mast at the deck. The hoist of these sails will approximate a hundred and fifteen feet. To the best knowledge of the writer there is only one other six-masted schooner afloat today.

As the Kenilworth, a four masted bark, this ship could log a good 325 miles in a day's run. After a fire in 1889 at San Francisco she was bought by Arthur Sewall of Bath, Maine, and was rebuilt as a four masted bark. She continued to make fast passages and on her first voyage for Sewall Capt. J. G. Baker wrote to the owners—"She drags no dead water and leaves it clean. Makes little or no fuss about it." She was consistently the fastest of the Sewall fleet and could easily outrun the Bath built Dirigo, Erskine M. Phelps, William P. Frye, Edward Sewall and others.

When she passed to the Alaska Packers and became the Star of Scotland, despite the weight of her years, she hurdled the horizons at a record clip and her run of 7 days 23 hours from Karluk, Alaska, to San Francisco stands unequaled today. The name Rex, under which she never made a passage, is to be painted out and as Star of Scotland she will again take to the seas.

Log Rafts To Be Curtailed

Following a practice started twenty-five years ago, the Benson Lumber Company of San Diego will ship logs in rafts down the coast from the Columbia River but in curtailed numbers. It was planned to send five of the 900 foot rafts, each containing 5,000,000 feet of lumber, down the coast this year but the mounting cost of logs and the uncertain outlook for the lumber market in 1942 has caused a reduction to three such rafts. Two of the three rafts have been built on the cradle at Kathlamet, Washington, and are ready for sea while the third is being assembled. The tow down the coast will be made by one of the big Red Stack tugs of San Francisco, a voyage which requires from two to three weeks.

The Benson Lumber Company, operating the only saw mill in San Diego, have sent 118 such log rafts out of the Columbia River in the twenty-five years since they originated the practice and in that time have lost only three, two by storms and one by fire, and of these three a good part was eventually salvaged. Logs rafted down during 1941 will not be sawn until 1942 hence they are a gamble in lumber futures. The first of the three 1941 rafts will leave the Columbia River about July 1.

San Diego Lumber Receipts Break Records

In the shipping of lumber to our farthest south Pacific Port there has been no slackening of pace and to May 1 a record total in excess of 53 million board feet have been dumped on the over-burdened docks and scattered on the city's waterfront boulevard. In one day, April 22, the steam schooners W. R. Chamberlin and the Oliver Olson struggled into port with a total of 4,650,000 feet, the largest single day's receipt since the first of the year. The masters of these vessels reported a scarcity of bottoms to handle the lumber waiting shipment from the Pacific Northwest to Southern California and the Atlantic Coast.

What's In a Name?

The United States Maritime Commission has a few more strings to tie to ship sale contracts and the latest rumor is that something is going to be done about it. Witness the case of the well known Quaker Line freighter San Bernardino which Capt. Nelson piloted frequently into Pacific Coast ports. During 1940 she was sold to a Panama company which flourished under the name of La Compania de Navigacion la Interoceana, S. A., who dubbed her "Atlantico." Then she vanished from the ken of coast shipping men until December 1940 when she nosed her way into the port of Osaka and shed completely the cumbersome and unrepeatable Panamanian company name. Hoisting the house flag of Mitsui and Company and taking a crew of obsequious Japanese she entered service for the Islands of the Rising Sun. To cap the situation, if you will look into your Lloyd's Register you will find that she was built during 1920 as the West Jappa.

San Diego Harbor Developments

In spite of the unprecedented pressure of detail work loaded onto the Harbor Commission, they are to be commended for their steady efforts to rearrange the jumble of canneries, airports, boat yards, municipal buildings, docks and waterside restaurants which hamper the extension of harbor development toward the Greater Port of the future. Present emergency work, although time consuming, is no barrier to their vision of the days to come, and gradually they are working out, with plant owners, plans to relocate industries in new industrial areas.

The latest move is the signing of a lease on four and a half acres of land at the foot of Schley Street to the California Packing Corporation. Here an ultramodern tuna cannery will be erected. The first unit, to cost an estimated $750,000, will be started in the immediate future. This will be the first of the big packing plants to move to the south bay area designated for such use by the Harbor Commission. The present "Calpac" plant is wedged in among aircraft factories on the Lindbergh Field area where space for aircraft service and plants is at a premium. The Harbor plans feature the eventual removal of all the fish canneries to the Schley Street area. Here the Tuna Clipper fleet can be unloaded and serviced to better advantage.

Norwegian Trawler in San Pedro

Twenty-five thousand miles is a long way to go for fish, but such was the avowed purpose of the little 70 foot Norwegian trawler Kaare II which, with a crew of eight, arrived at San Pedro April 18. The master, Capt. Ottar Novik, saw the futility of remaining in Norway to face the loss of of their boat to the invading Germans and a future of impoverished bondage. Therefore they swiftly loaded her with fuel and provisions and headed for the Pacific Coast via the Panama Canal. As they considered there were too many fishermen in the North Atlantic they chose the long run to the Pacific and will fish in the waters off British Columbia. Prophetically, Capt. Novik said, "When the war is over we sail back to Norway."

Yard Notes

Immediately after launching the mine sweeper Ruff at seven in the evening, April 23, the Martinolich Shipyard at San Diego laid the keels for two large tuna boats. The first to be laid down was for a 103 foot clipper to the order of Manuel Madruga and will cost an estimated $140,000. The second keel was for Andrew Castagnola for a tuna clipper to cost $225,000. This yard has another contract for a 103 footer for Frank Perry, to cost $140,000, the keel of which will be laid in June.

* * *

At the Campbell Yard, San Diego, the 66 foot Madalyn R. is nearing completion. Building at a cost of $55,000 she will carry 75 tons of fish. Owners are Rocco Parmigiani, Serafino Parmigiani, Jay Mellusi and Serafino Romani. The keel for a 128 foot tuna clipper of the all-brine type to be powered with a supercharged 450 hp engine was laid recently for G. Vattuone and Sons and will cost $210,000. Another keel for an all-brine tuna boat for Antonio J. Tavares and M. Ferriera was laid about the same time. The latter will be a 110 footer and will cost $175,000. Capacity will be 125 tons.

* * *

The San Diego Marine Construction Company is preparing to lay keels for four minesweepers for the Navy to cost $337,500 each.

* * *

The Harbor Boat Works is busy with repair work on the commercial fishing boats and has the new 80 foot Mexican Patrol boat well in frame.

The clipper City of San Diego is being converted to an all-brine boat at the Campbell yard and is having new bait boxes and a new after deck added at a total cost of about $40,000.

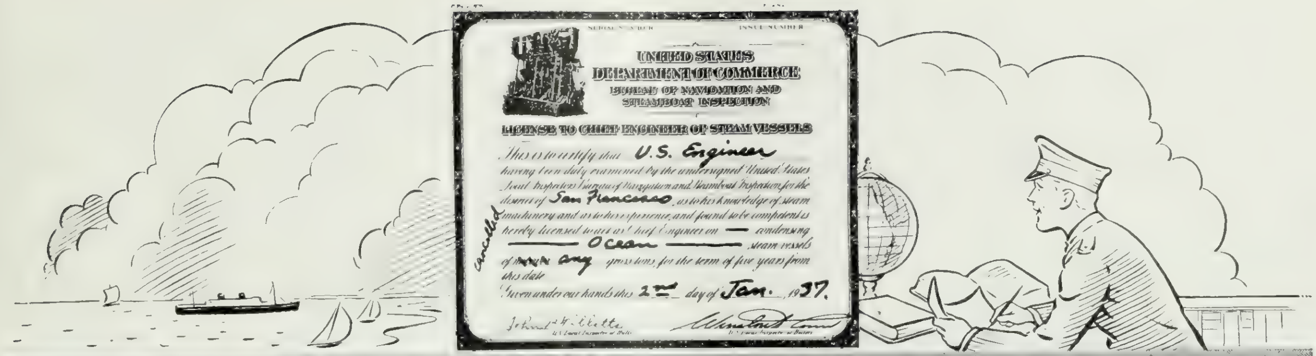
* * *

The big steel Santa Cruz is being rebuilt for Joe Medina and has been stripped down to the bare hull. New steel upper works are being added, new refrigerating machinery for the all-brine system installed together with two new 75 kw Union Diesel generator sets.

* * *

After long idleness, after a disaster in southern waters where she went ashore and wrecked, the San Rafael is being rebuilt and machinery overhauled at the San Diego Marine Construction Company. She will be renamed and will return to tuna fishing for Van Camp under the name of America.

A typical San Diego-built tuna clipper, the Azoreana. She is 130.4 feet long by 29.6 beam by 13.2 depth and powered with a 600 bhp diesel



SERIAL NUMBER ISSUE NUMBER

UNITED STATES
DEPARTMENT OF COMMERCE
BUREAU OF NAVIGATION AND
STEAMBOAT INSPECTION

LICENSE TO CHIEF ENGINEER OF STEAM VESSELS

This is to certify that U.S. Engineer having been duly examined by the undersigned United States Local Inspectors Bureau of Navigation and Steamboat Inspection for the district of San Francisco, as to his knowledge of steam machinery and as to his experience, and found to be competent is hereby licensed to act as Chief Engineer on — condensing — Ocean — steam vessels of ~~[illegible]~~ any gross tons, for the term of five years from this date

Given under our hands this 2nd day of Jan., 1937.

Cancelled

U.S. Local Inspector of Hulls

U.S. Local Inspector of Boilers

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by "The Chief"

"The Chief's" department welcomes questions—Just write "The Chief," Pacific Marine Review, 500 Sansome Street, San Francisco, California

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ENGINEERING THERMODYNAMICS

I—INTRODUCTORY

This subject is one not usually attempted by operating engineers although one of the most important ones in engineering colleges. In the past, the marine engineer has had little opportunity or little need to study the theory of heat. He has had to accept the statements of designers that raising pressure increases efficiency without any reasonable explanations. If questioned further, a long string of mathematical expressions would be the answer and the subject has been a locked compartment open to only a chosen few.

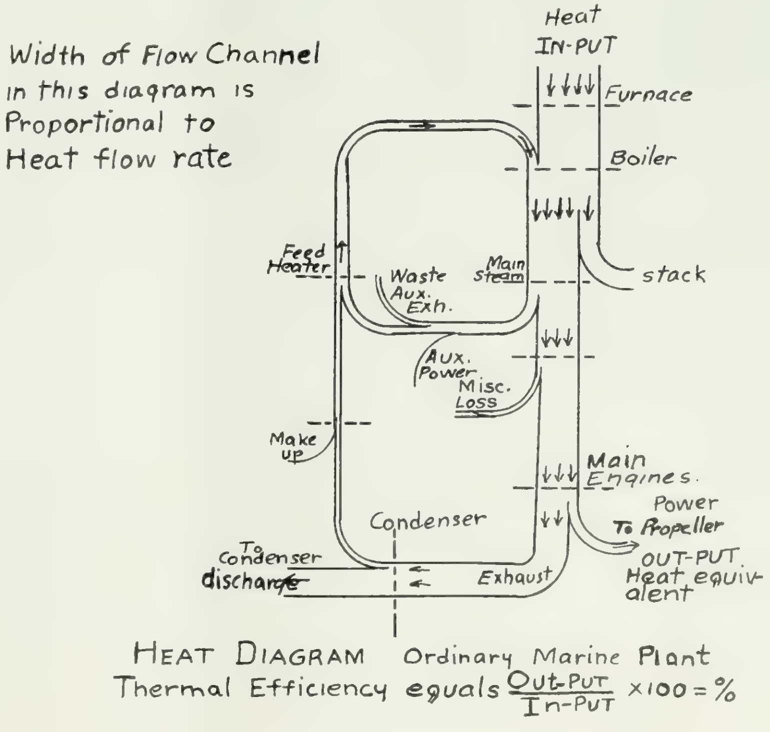
The subject is being taught to a limited extent in the Maritime Commission Schools for marine engineers. It is exceedingly bewildering unless approached from the firm groundwork of a few fundamentals, and unless care is taken to present a broad overall bird's-eye view of the subject and its importance first.

In the ensuing rather extended series of articles, "The Chief" will attempt to present this subject. If the reader will give time and patience to follow and thereby perceives only a part of the beauty, the absorbing interest, the all-embracing nature and throbbing vitality of this subject, he will find his time well spent, his curiosity vastly enlarged and his knowledge of engineering tied-up into a common fabric immensely stronger and useful.

First, the word itself: Translated into simple English it means heat activities or heat energies, and it is not quite so terrifying when you think of those easily understood words.

An experienced engineer without knowledge of thermodynamics can give his teacher a very bad time with questions. To illustrate this and the importance of the subject, consider the following argument which might take place, and note how reasonable yet wrong the engineer is.

Engineer: "But why heat the feed water from steam deliberately drawn out of the turbine? I can understand using waste heat in stack or auxiliary



HEAT DIAGRAM Ordinary Marine Plant
Thermal Efficiency equals $\frac{\text{Out-Put}}{\text{In-Put}} \times 100 = \%$

exhaust but not useable steam from turbine."

Teacher: "Well, by letting the steam do some work in turbine then taking out for heating, we get more efficiency."

Engineer: "That is just trading pennies. Heat is heat. Once we have the steam why not let it do its work completely in the turbine and use real fire or boiler surface to heat the water? We have to heat it, why not directly instead of around about with all the extra heat exchangers and piping?"

Teacher: "Well, you see, in thermodynamics we learn about the regenerative cycle where increase in entropy. . ."

Engineer: "Aw, just forget it! But tell me this. Why go to expense of high pressure? Don't just tell me it increases efficiency! That's the rubber stamp answer. I think I can show you where you lose efficiency. Now, look. It's the most steam from the pound of oil we want. That is boiler efficiency. From the steam tables you will find that the higher pressure takes more heat per pound of steam. At 165 lbs. there are 1195 Btu of heat in the steam, while at 470 lbs. there is 1204 Btu. Thus, we get less steam for a barrel of oil at high pressures. You can design the turbine or engine for either pressure."

Teacher: "No. It's more heat we want at a higher temperature."

Engineer: "Well, look, why go to the real high pressures, because there a pound of steam at say 1485 lbs. has only 1170 Btu. And if it's more temperature you want, why not stay down to a reasonable pressure and just superheat, say at 165 lbs. and 900° F.? That would simplify boilers."

Teacher: "We could then only expand to a lower temperature and would have dry steam in the exhaust, perhaps superheated."

Engineer: "Well, you want that, don't you? We only condense in the condenser, anyway. I thought they wanted dry steam in the turbines."

Teacher: "You see, the temperature—entropy diagram shows that we waste more heat that way. Now look at this mollier diagram. In thermodynamics we learn . . ."

Engineer: "Aw, just forget it! You say the efficiency of a good marine plant may be as high as 25%. That must be wrong. The boiler, by your own statement, is 85%, the turbine 70%; this makes, by multiplying like you told me, 59½%. Where can you get an overall efficiency of as low as 25%? There is no loss in the condenser or very little. The steam and vapor of the exhaust of a good turbine is as cool as the palm of your hand, would not make a good shower bath. There is very little loss of heat there."

Teacher: "On the contrary, there is a tremendous loss in the exhaust and condenser. Now, look at this curve. You see where this increase in entropy increases the area under the curve."—

Engineer: "Aw, just forget it! If you have to know thermodynamics to run these engines, I'll just go back to passing coal—if there are any more coal-burners."

Teacher: "Not at all. But you have more than the normal intelligence and thus have an unsatisfied curiosity about the reasons for all the things you see about you. You have read a good deal and have accumulated what might be called a dangerous amount of knowledge. You have gone so far now with your reading that you *simply must* enter the broad realm of thermodynamics and find the answers there to all your questions. Then you can clear up that Junior on your watch who took the subject in school but without practical experience is all muddled up."

Engineers' Licenses for April

Name and Grade	Class	Condition
SEATTLE		
W. J. Cecchi, 2nd Asst.	SS, any GT	RG
L. E. Walker, 2nd Asst.	SS, any GT	O
D. W. Williams, 2nd Asst.	SS, any GT	RG
C. C. Jones, 3d Asst.	SS, any GT	O
J. E. Gilden, Chief	MS, any GT	O
SAN PEDRO		
W. C. Horner, 1st Asst.	SS, any GT	RG
J. R. Longbucco, 2nd Asst.	SS, any GT	RG
D. G. MacDonald, 2nd Asst.	SS, any GT	RG
C. B. Bailey, 3d Asst.	SS, any GT	O
L. Q. Sims, 3d Asst.	SS, any GT	O
O. E. Hitchcock, Chief	MS, any GT	O
G. H. Mittan, 2nd Asst.	MS, any GT	O
L. W. Hunniecutt, 1st Asst.	SS, any GT	RG
H. L. Mollenkopf, 1st Asst.	SS, any GT	RG
J. M. Hamby, 2nd Asst.	SS, any GT	RG
G. A. Robinson, 2nd Asst.	SS, any GT	O
R. M. Keimel, 3d Asst.	SS, any GT	O
C. R. Page, 3d Asst.	SS, any GT	O
A. J. Sammons, Sr., 3d Asst.	SS, any GT	O
E. A. Wilson, 3d Asst.	SS. any GT	O
W. F. Sauerbier, Chief	MS, 750 GT	O
SAN FRANCISCO		
A. C. Allen, Chief	SS, any GT	RG
C. G. Hansen, Chief	SS, any GT	RG
W. R. Watler, Chief	SS, any GT	RG
R. J. Cowell, 1st Asst.	SS, any GT	O
J. A. Sherson, 1st Asst.	SS, any GT	RG
H. E. Morgan, 1st Asst.	SS, any GT	RG
R. P. Huber, 2nd Asst.	SS, any GT	RG
F. A. Cullen, 2nd Asst.	SS, any GT	RG
J. P. Brady, 2nd Asst.	SS, any GT	RG
J. P. Kelliher, 2nd Asst.	SS, any GT	RG
J. E. Roberts, 2nd Asst.	SS, any GT	O
R. W. Johnson, 2nd Asst.	SS, any GT	O
H. L. Rogers, 3d Asst.	SS, any GT	O
H. L. Kubel, 3d Asst.	SS, any GT	O
L. H. Erickson, 3d Asst.	SS, any GT	O
O. G. Rutherford, 3d Asst.	SS, any GT	O
L. A. Heller, 3d Asst.	SS, any GT	O
W. L. Russon, Jr., 3d Asst.	SS, any GT	O
M. P. Locke, 3d Asst.	SS, any GT	O
E. J. Wells, 3d Asst.	SS, any GT	O
W. J. Rockstroh, 3d Asst.	SS, any GT	O
R. M. Wimer, 3d Asst.	SS, any GT	O
H. A. Doell, 3d Asst.	SS, any GT	O
I. Singman, 3d Asst.	SS, any GT	O
B. T. Ross, 3d Asst.	SS, any GT	O
R. L. Peck, 3d Asst.	SS, any GT	O
J. G. O'Donnell, 3d Asst.	SS, any GT	O
R. M. Elden, 3d Asst.	SS, any GT	O
J. H. Schwab, 3d Asst.	SS, any GT	O
H. E. McConnell, 3d Asst.	SS, any GT	O
C. H. Gatter, 3d Asst.	SS, any GT	O
C. V. Kelley, 3d Asst.	SS. any GT	O
Fred Bangs, Chief	MS, any GT	RG
J. H. Hudson, Chief	MS, any GT	O
C. Taylor, Chief	MS, any GT	O
F. C. Maguire, 2nd Asst.	MS, any GT	O
M. G. Spenser, 2nd Asst.	MS, any GT	O

Abbreviations: SS is steamship; MS is motorship; GT is gross tonnage; O is original license; RG is raise of grade. All of these licenses are for ocean service.

* * *

Thermodynamics is the science of the interrelation between *energy* and *heat* and the quantitative interchangeability. Engineering textbooks introduce the first, second and third laws as formulated by Sir Isaac Newton, the laws of gas expansions, heat, work, power, reversible and irreversible cycles, adiabatic and isothermal expansions and much mathematics.

"The Chief" will attempt the subject using curves instead of formulas and descriptive illustrations with simple explanations.

The overall problem is to obtain the most motive power from whatever source of energy is available and practical and at as high an efficiency as possible. The efficiency of conversion is the energy given to us by nature divided into the energy we convert into motive power.

In spite of the scientific and engineering ability of mankind, he has found and admitted that he cannot create or destroy energy. It is his heritage from Mother Nature only.

All the energy known to man comes from the sun, as radiant heat and light, except infinitesimal amounts which come from the tides and other cosmic influences. The sun's energy, however, must be used as it is given off, otherwise its availability is forever lost to men. Fortunately, the earth, with its abundance, has a way of locking up and storing the availability of the sun's energy and holding it for man's use, provided he finds the key to the storehouse.

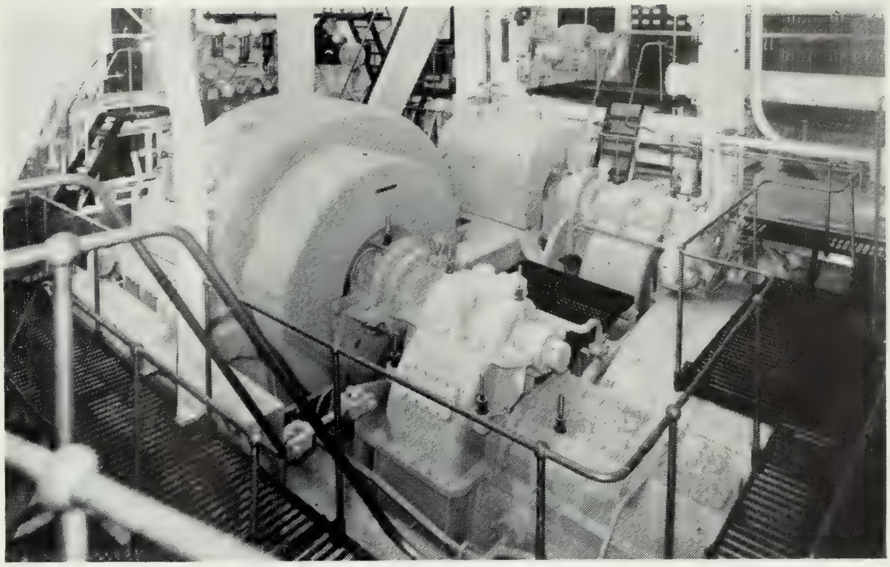
This vast store of locked-up available energy is the hydrocarbons found everywhere and called fuel.

Through a still not-understood process, the chlorophyll of plant life has the property of combining the sun's radiant energy with carbon-dioxide of the air, and hydrogen of water to form a hydrocarbon which is the wood-like fiber of all plants. In past ages, vast amounts of this fiber have been transformed into coal through decomposition away from oxygen and subjection to great pressure and temperature over long periods.

Supplementing this process is the plant-eating organism of the animal kingdom or under-water life which builds its bodies from hydrocarbons, then die, decompose and with pressure, temperature and time we have oil.

Thus, fuel is stored up for us in quantities, the limits of which we know little. Oil is said to be in sight for 50 to 100 years, but war may rob our descendants of this wonderful gift. Coal has been surveyed to last us for 1000 years. It is to be hoped that our people in succeeding generations will find a way to convert plant life to oil quickly without the intervening millions of years.

Small wonder, then, that engineers should strive to make the fuel last longer, and particularly where it is used on a ship or moving engine and must be carried. Furthermore, the advantage lies with fuels carrying the most energy per pound or per ton.



Man's success in converting the energy of fuel into motive power is not flattering. He early learned to use the key to the stored-up energy by applying fire and through combustion (oxydization) released the energy at *controlled rates* (except in explosions and conflagrations). He is able to convert to usefulness a surprisingly small amount of the stored energy. For example, consider the adjoining table of efficiency. Here the efficiency in per cent is the heat equivalent of the power output divided by the heat input.

Thermal Efficiency of Several Engines

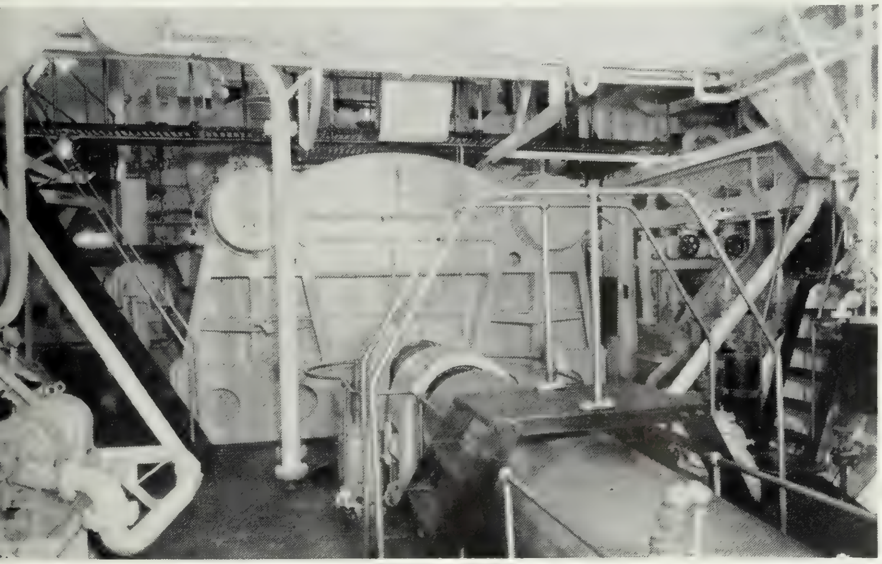
Per cent Efficient	*Type of Engine*
5-10	Noncondensing steam locomotives.
10-15	Condensing steam small plants.
15-20	Condensing marine steam.
20-25	Condensing large stationary steam plant.
25-30	Very high pressure, very large modern turbine plants.
30-35	Ordinary diesel marine plant.
35-40	Mercury-steam plant. Good diesel plant.
40-45	Diesel plant using all waste heat. Best.
45-50	? ? ?
50-80	Will the future fill in this gap?

Some idea of where the losses go and the relative amounts may be had from the accompanying figure where the heat input at the top moves downward and is diverted and lost leaving only ⅕ for the turbine output. The width of the flow channel is proportioned to the amount of heat or rate of heat flow or its equivalent.

Note that the condenser takes away much more than the engine does. Even the stack throws away more than goes out on the propeller.

Questions and arguments on this subject are particularly welcome at this time.

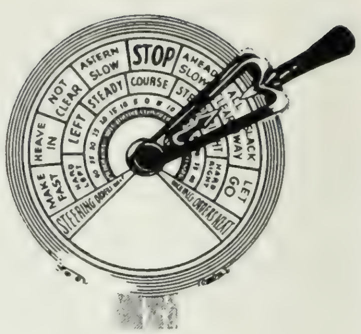
In order to get the benefit of succeeding articles, it is suggested that these early sections be carefully studied until understood and then saved for future reference.



The illustrations on this page are from views taken in the engine room of a modern American steamer with cross compound, double reduction geared turbines

Steady as you go!

KNOWLEDGE IS THE STRAIGHT COURSE TO ADVANCEMENT



A Department for Deck Officers

by "The Skipper"

Questions Welcomed. Just Address "The Skipper," Pacific Marine Review, 500 Sansome Street, San Francisco, California

WIRE ROPE

I—TYPES AND CARE

QUESTION

How is wire rope made?

ANSWER

The wire ropes used in ship work are all of the round-stranded type. That is, they are made up of strands of wire twisted around a core which is usually hemp. The strand is the wire rope construction unit. In the commercial wire ropes the strand consists of 4, 7, 12, 19, 37, 61 or 91 wires twisted together. There are several types of strand construction as, for example, in 19 wire strands we may have:

(1) Common construction using 19 wires all the same size.

(2) Warrington (3-size wire) construction in which seven wires of uniform size are surrounded by 12 wires alternately large and small size; this construction increases the metal area and the strength by approximately ten per cent without loss of flexibility.

(3) Seale construction (3-size wire) uses a large center wire with a layer of nine smaller wires and an outside layer of nine larger wires. This gives a rope of greater stiffness than the other two types of construction and has only a limited application.

Warrington construction is used in the great majority of hoisting or hauling applications.

Deck Officers' Licenses for April

Name and Grade	Class	Condition
SEATTLE		
H. R. Sterner, Master	SS, any GT	RG
G. G. Roberts, Chief	SS, any GT	RG
B. Shaw, 2nd Mate	SS, any GT	O
L. Jorgensen, 3d Mate	SS, any GT	O
H. A. Kitchel, 3d Mate	SS, any GT	O
P. H. Odsen, 3d Mate	SS, any GT	O
T. J. Poole, 3d Mate	SS, any GT	O
C. A. Rood, 3d Mate	SS, any GT	O
SAN PEDRO		
D. Shippee, Master	SS, any GT	RG
L. W. E. Blanc, 2nd Mate	SS, any GT	O
C. E. Haas, 3d Mate	SS, any GT	O
H. L. Howser, Chief	SS, any GT	RG
T. A. Currie, 2nd Mate	SS, 7500 GT	O
E. F. Maxwell, 2nd Mate	SS, any GT	RG
A. W. Nelson, 3d Mate	SS, any GT	O
T. W. Steggall, 3d Mate	SS, any GT	O
PORTLAND		
W. R. Wilson, 2nd Mate	SS & MS, any GT	RG
L. L. Beasley, 3d Mate	SS & MS, any GT	O
SAN FRANCISCO		
S. Elliot, Master	SS, any GT	RG
A. Young, Master	SS, any GT	RG
P. F. Meyer, Master	SS, any GT	RG
K. B. Lawrence, Chief	SS, any GT	RG
J. M. Strangland, Chief	SS, any GT	RG
A. Witmer, 2nd Mate	SS, any GT	RG
R. W. Walton, 2nd Mate	SS, any GT	RG
H. S. Littlefair, 2nd Mate	SS, any GT	RG
E. N. Kettenhofen, 3d Mate	SS, any GT	O
R. C. Treanor, Jr., 3d Mate	SS, any GT	O
H. L. Motes, 3d Mate	SS, any GT	O
R. L. Bradford, 3d Mate	SS, any GT	O
R. E. Donaldson, 3d Mate	SS, any GT	O
R. A. Murry, 3d Mate	SS, any GT	O
J. N. Jensen, 3d Mate	SS, any GT	O
K. R. Morrison, 3d Mate	SS, any GT	O
N. F. Main, 3d Mate	SS, any GT	O
Z. A. Gwartney, 3d Mate	SS, any GT	O
G. W. Prada, 3d Mate	SS, any GT	O
W. C. Weldon, 3d Mate	SS, any GT	O
R. W. Newman, 3d Mate	SS, any GT	O
P. R. Haertel, 3d Mate	SS, any GT	O
R. T. Cavins, 3d Mate	SS, any GT	O
J. I. Carter, 3d Mate	SS, any GT	O
K. C. Shaffer, 3d Mate	SS, any GT	O
R. P. Calou, 3d Mate	SS, any GT	O

Abbreviations: SS is steamship; MS is motorship; GT is gross tonnage; O is original license; RG is raise of grade. All of these licenses are for ocean service.

QUESTION

What is meant by "lay" in wire rope?

ANSWER

The manner in which the strands are wound around the central core is called lay. If the strands are twisted to the right, the rope is called a right lay. If they twist to the left, it is left lay.

The strands are usually laid into the rope in a direction opposite to the twist of the wires in the strand. Such rope is called regular or common lay.

When the wires in the strand and the strands in the rope twist in the same direction, the result is called lang-lay rope.

QUESTION

How should wire rope be kept in good condition?

ANSWER

Wire rope should not be coiled or uncoiled like Manila rope. If received in a coil, one end should be held and the coil rolled along the deck like a hoop until the wire rope is laid out and straightened. Then it should be reeved through the sheaves, or onto the drum of a winch or fastened into the standing rigging, according to the use for which it is intended.

Practically all wire rope used at sea is galvanized to protect it against rust. However, all wire rope, galvanized or plain, must be treated at regular intervals with a proper lubricant to keep them pliable and to prevent wear between strands and between wires in the strands. Any of the engineering salesmen of the oil corporations can give you good recommendations on oils especially compounded for wire rope service.

Before a wire rope is cut, servings of seizing wire should be put on the rope at each side of the proposed cut. These must be of sufficient strength and tightness to hold the strands securely in place, otherwise one strand on each side is sure to work back; and when subsequently a load is taken by the rope, that strand will not bear its full share and the others will be overloaded.

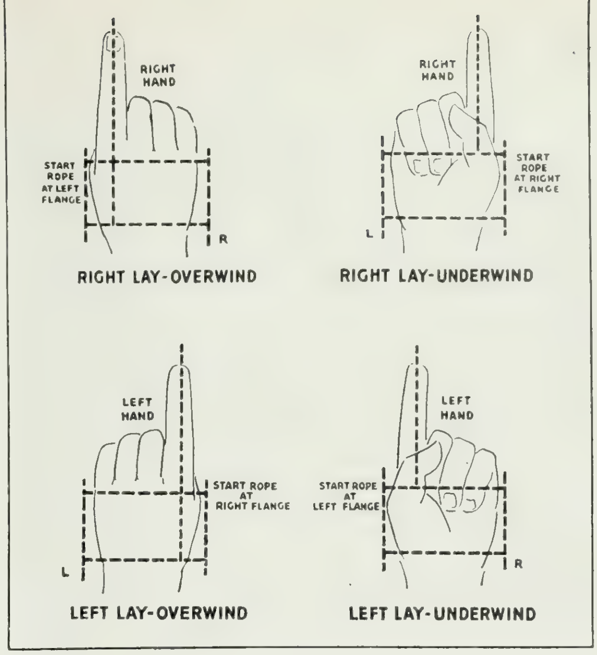
QUESTION

Why are fairleaders used?

ANSWER

Fairleaders are very necessary in the proper use of wire rope, especially on board ship where the pull on the rope by winch drum, capstan or gypsy is almost always in a direction more or less different than the direction of movement desired. Fairleaders are used to change the direction of the rope pull with the least possible friction and rope wear.

It is very important that the sheaves of fairleaders be of ample size and that the fairleaders be so placed that the rope from drum to fairleader has the least possible average angle as it progresses from one side of drum to the other. In other words, the lead from drum to first fairleader sheave should be as long as possible, and the entrance of rope to sheave should be as nearly as possible in a line perpendicular to the drum axle at the center of drum face.



A diagram showing how to use the fist and index finger as guides in reeving rope onto a smooth drum

QUESTION

How should rope be reeved onto the smooth drum of a winch so that the rope will hug the drum tightly and also each turn will wrap tightly against the preceding turn?

ANSWER

This is an important question, because both Manila and wire rope can very quickly become badly damaged and practically useless if they are improperly rove onto a smooth drum. There is an old rule for proper procedure that is somewhat complicated and rather hard to remember with accuracy. Here it is:

"When a right-lay rope is being underwound on the drum (which is to say, it leads from the bottom of the drum) start it from the right flange, looking at the drum from the rear. If a left-lay rope, start it from the left flange. Conversely, if a right-lay rope is being overwound (that is, it leads from the top of the drum) start it from the left flange. If a left-lay rope (overwound) start it from the right flange."

The diagram herewith presents this rule in a graphic form that is much more easily held in memory.

In this diagram your doubled fist represents the drum and the first or index finger represents the flange at which you start reeving the rope onto the drum. With right-lay rope you use your right fist, with left-lay rope your left first. For overwound reeving hold your fist back up. For underwound reeving hold your fist palm up. Standing at the rear of the winch, your index finger pointing at the drum will indicate in each case the flange at which you should start.

Table Showing Strength, Proper Working Load, and Drum Sizes for Various Sizes of Wire Rope of 6 Strands—19 Wires

Diam. in inches	Circum. in inches	Approx. strength in tons (2,000 lbs.)			Proper working load in tons (2,000 lbs.)			Recommended drum diameter in feet	
		Iron	Cast Steel	Plow Steel	Iron	Cast Steel	Plow Steel	Iron	Cast and Plow Steel
¼	¾	1.1	2.2	2.65	.22	.44	.53	1½	1
5/16	1	1.5	3.1	3.8	.30	.62	.76	2	1¼
⅜	1⅛	2.4	4.8	5.75	.48	.96	1.15	2¼	1½
7/16	1¼	2.9	6.5	8	.58	1.30	1.6	2¾	1¾
½	1½	3.9	8.4	10	.78	1.68	2	3	2
9/16	1¾	4.7	10	12.3	.94	2	2.4	3½	2¼
⅝	2	6	12.5	15.5	1.20	2.5	3.1	4	2½
¾	2¼	8.5	17.5	23	1.70	3.5	4.6	4½	3
⅞	2¾	11.8	23	29	2.36	4.6	5.8	5½	3½
1	3	14.5	30	38	2.90	6	7.6	6	4
1⅛	3½	18.6	38	47	3.72	7.6	9.4	7	4½
1¼	4	22.8	47	58	4.56	9.4	12	7¼	5
1⅜	4¼	28	56	72	5.6	11.2	14	8½	5½
1½	4¾	33	64	82	6.6	12.8	16	9	6
1⅝	5	38	72	94	7.6	14.4	19	10	6½
1¾	5½	44	85	112	8.8	17	22	11	7
1⅞	5¾	50	96	127	10	19	25	12	8
2	6¼	55	106	140	11	21.2	28	12	8
2¼	7⅛	72	133	186	14.4	26.6	37	14	9
2½	7⅞	92	170	229	18.4	34	46	15	10
2¾	8⅝	111	211	275	22.2	42.2	55	17	11

A recirculating air cooling unit with protected intake

Refrigerated Cargo Spaces On Matson Liners

A revolutionary type of refrigerated cargo space for passenger liners of the Matson Navigation Company was installed during the annual overhaul and inspection recently of the two Matson liners operating between California and the Territory of Hawaii, the Lurline and the Matsonia.

Unlike anything that has appeared before, except in similar and recent installations on the vessels of the Matson fleet, the new refrigerated cargo compartments were designed and constructed by the company's own personnel in its construction and repair department.

It is believed that Matson's new contribution to the art of building fire-resistant insulated cargo rooms aboard ship complies with Senate Report No. 184, which sets forth requirements of fireproofing. For four years Matson engineers have been experimenting and developing what they believe to be a practical answer to the exacting requirements of the Senate report.

In the beginning, Matson engineers felt that corkboard bonded with natural resins came nearest to meeting the many and peculiar requirements for insulation of marine refrigerated spaces. To further improve corkboard's fire-resistant properties, the new method completely encloses this material in a continuous and non-combustible envelope.

The first step in the construction of these cargo spaces aboard the two passenger liners, required the erection of suitable steel enclosures, against which is laid the necessary number of layers of corkboard set up in an approved waterproof cement. Over the cork is applied the inner lining of fire-resistant panels similar to the material known in the trade as "Transite."

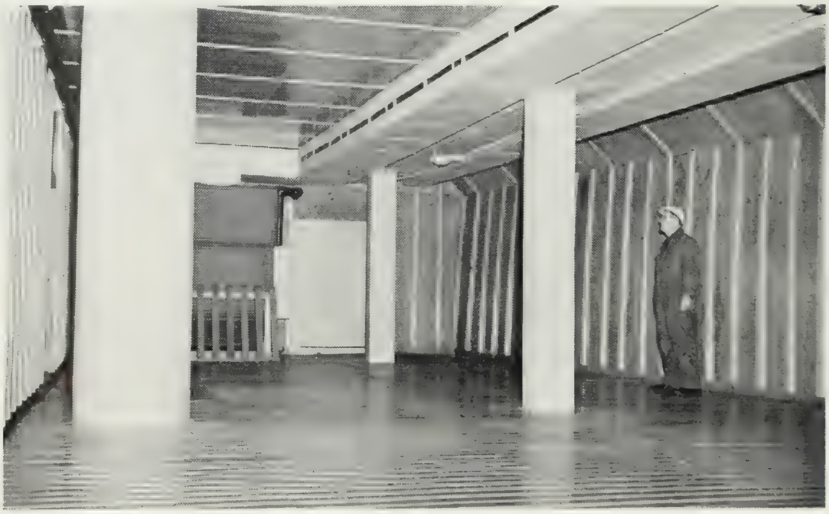
Matson engineers insulated the floor and deck head in a similar manner as that of the bulkheads, except the deck insulation is covered with a specially developed waterproof and reinforced concrete.

The cost is no greater than the wood, cork and mastic construction used in passenger vessels constructed in the past few years. Matson engineers feel that it successfully competes with and perhaps excels other recent developments in fireproof construction of shipboard refrigerators.

This new type of insulated chamber may be refrigerated by any standard equipment. Installation aboard the Lurline is equipped with York Freon F-12 units and cold diffusers, and Armstrong corkboard is used for insulation.

The new reefers are located in the Number Two F-Deck space formerly used as a general cargo compartment. The three chambers have a total net volume aboard the Lurline of more than 18,000 cubic feet and are designed to maintain a minimum temperature of 10° F.

The Lurline's Freon machinery was installed after a well-developed space-conserving plan had arranged compressors, condensers and receivers. The room-cooling units are equipped with direct expansion coils in the diffusers and high-capacity circulator fans. The



One of the refer rooms, featuring the smooth deck and bulkhead finish and the air circulating ducts on ceiling fans provide complete recirculation through ducts along the ceiling, discharging toward the batten-covered bulkheads. Expansion coils are fitted with hot fresh water defrosting sprinkler heads, controlled outside the refrigerator compartments. The units are automatic, and the compressors — which may be operated at two speeds —are equipped with high and low pressure automatic cut-out controls.

Refrigeration engineers, technicians, ship owners and shippers visiting the newly-completed reefer spaces have been highly complimentary of the design, and the Matson engineering staff, while feeling the design is subject to further development, believes the installations are real contributions to the art and worthy of imitation.

This refrigerating chamber features a different arrangement of cooling unit and recirculating ducts

A Challenge To American Shipbuilders

(Continued from page 41)

In July, 1940, eighteen privately owned yards were building ships; more than at any time since the last war. These yards were efficiently organized and equipped as a result of the naval shipbuilding program, which began in 1933, and the merchant marine program which was started by the United States Maritime Commission in 1938. These programs enabled all of the shipbuilding companies to build up their organizations and improve their facilities.

The fact that shipyards have increased their forces by 500 per cent in a little over one year indicates a pretty substantial foundation. As a result of these programs, the technique of shipbuilding has improved materially. Welding will facilitate the present program very much, as compared with riveting.

Higher efficiency steam machinery in both merchant and naval vessels has proved highly beneficial to building and operating efficiency, particularly on naval vessels where the cruising radius has been increased materially. Assembly of large segments of the ship by welding on racks and erecting as a unit in the hull simplifies construction and reduces building time on the ways.

I would summarize the situation as follows:

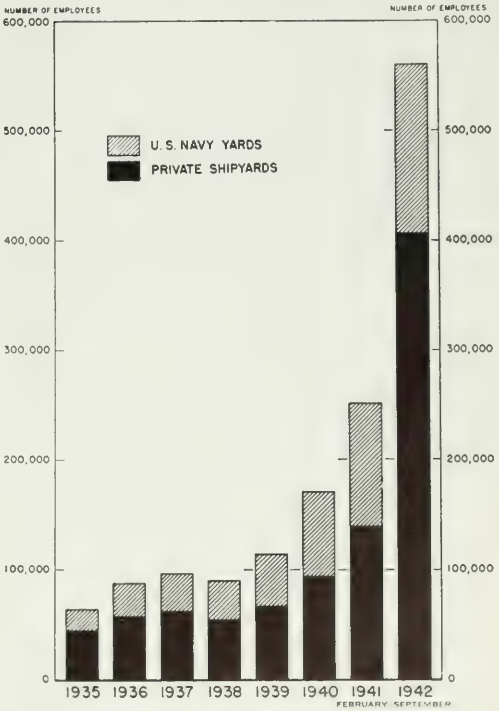
A—We have the most extensive program of shipbuilding ever undertaken in this or any other country in the time set for its completion. It includes approximately 900 merchant ships aggregating about five millions gross tons and 900 naval vessels of two and a half millions displacement tons. The aggregate value will approximate close to ten billions of dollars—the largest single item in the Defense and Lend-Lease programs. Most merchant tonnage is scheduled for completion by the end of 1943 and the delivery of the naval tonnage is spread over five years, with a large part for delivery before early 1944.

The merchant ship program includes: duplicates of highly efficient high speed cargo ships and tankers previously built under the Maritime Commission's long range program; emergency freighters for use by the British; and a small number of tankers and freighters for private owners.

The naval program includes all types of ships from great battleships and cruisers with their complements of destroyers, submarines and tenders to the small harbor and coastal craft.

TOTAL EMPLOYMENT IN SHIPYARDS ON CONSTRUCTION AND REPAIR OF U. S. GOVERNMENT, BRITISH AND PRIVATE VESSELS

ANNUAL AVERAGE 1935 - 1940, FEBRUARY 1941 AND ESTIMATE FOR SEPTEMBER 1942



Courtesy U. S. Bureau of Labor Statistics

B—Existing yards have been expanded to the limits of their capacities, and additional yards are being opened for the emergency program with a result that ultimately there will be 42 shipbuilding yards with a total of about 350 shipways.

C—Training courses have been established in all the yards supplementing their regular long term apprentice courses. The effective results of these activities are demonstrated by the 500 per cent increase in the number of employees. Today, there are more supervisors than there were total employees a few years ago.

D—Overtime and shift work are employed wherever practicable, and new methods whereby certain trades work continuously around the clock.

E—As a result the actual construction time of vessels has been reduced materially. Modern 16-knot cargo ships are being built in five and six months today, as compared with seven to ten months for simple 10-knot ships built during the last war. Naval ships, with all of their modern complexities, are building today in shorter time.

The program ahead of the industry must be considered colossal. Witness the nine to ten billions of dollars of shipbuilding today, which includes seven billions for the United States Navy's ships alone, as compared with three billions for merchant ships and two billions for the Navy in the last World War. The present program involves approximately one million man years of labor, or many times the shipyard labor load during the last war. Problems before the industry in the order of their importance are:

(1) Labor—

(a) The industry must increase its present force by 200 to 300 thousand men. Considering the demands of the other defense industries, there will probably be a definite shortage of labor, which may require some allocation of man power.

(b) The attitude of labor is not too healthy and merits special consideration. Increased organizational activities discourage discipline, and prevent the maximum production for the facilities available. Certain key trades, already highly organized, appear to be limiting production.

(c) All plants should be put on a 48-hour week by legislation and no overtime should be paid unless a man has worked over 48 hours in any week. This is to discourage men working at overtime pay and then laying off during straight time days. Shipbuilding labor is paid the highest rates in the durable industries. Earnings with overtime average about $46 per week. Many skilled men are making over $60 per week.

(2) Materials and Tools—

Urgency of demand for ships, and their large proportion of the total National Defense Program, should establish the highest possible priority rating for shipbuilding industries until they get up to their production schedules. The shipyards will be able to receive and install machinery and equipment much faster than they can be supplied at present.

(3) Continued care should be taken in locating new shipyards, so as to avoid further dilution of the supply of experienced supervisors and labor to the point where the effectiveness of yards already in production will be impaired.

(4) All contract negotiations should be concluded promptly, and on an entirely fair and equitable basis on the following theories:

(a) That the first essential is to get the ships built.

(b) That hazards of future contracts are uncertain and great.

(c) That any unreasonable profit will be leveled off by taxes.

The U. S. Navy Department and the Maritime Commission have done a tremendous job extraordinarily well and have shown splendid foresight and energy in pushing their programs.

The pyramiding load has superimposed additional work on an already overloaded industry. The changes as to the types of ships most urgently required, has resulted in the changing of objectives of an industry working under high pressure.

In view of these conditions, it might be advisable for the Government to reappraise the shipbuilding ability of the country so as to be assured that it is being used in the most effective manner to produce the greatest number of the most essential types of ships in the least possible time.

Such reappraisal may show that energy now being exerted on types of ships which cannot possibly be delivered before 1944 or 1945, might better be expended on ships which could be made available in 1942 and 1943, if diversion of types is promptly made.

This overall situation, affecting as it does not only the shipbuilding industry, but the many industries that are supplying machinery and equipment for these ships, is a matter that can only be handled by those in our Government responsible for fundamental policies.

(Abstract of address before the Annual Meeting of Academy of Political Science, New York, April 16th, 1941.)

San Francisco Firm Heat Exchange Specialists

The Eugene V. Winter Co., engineers of San Francisco, report that they have furnished much of the heat exchange equipment installed on the motorship American Manufacturer, delivered in April by the Western Pipe and Steel Co., and on her four sisters now under construction.

This equipment was manufactured by the Condenser Service and Engineering Co. of Hoboken, New Jersey, for whom the Winter company are Pacific Coast representatives. It included for the five vessels:

Five salt water evaporators, each with a capacity to handle 30 tons per day.

Five distillers, each with a capacity to deliver 6000 gallons of fresh water per day.

Fifteen lubricating oil coolers, each with a capacity to cool 300 gpm.

Fifteen jacket water coolers, each with a capacity to cool 375 gpm.

Ten fuel oil heaters for main engine, each with a capacity for heating 2240 pounds per hour.

Five fuel oil heaters to serve the oil purifiers, each with a capacity to heat five gpm.

Ten lube oil heaters, serving lube oil purifiers, each with a capacity to heat five gpm.

Five oil and water separators, each with a capacity to treat 30 tons per day.

The Eugene V. Winter Co. represents also the Maxim Silencer Co. of Hartford, Connecticut, who built the ten spark arrestor mufflers required by the main engines on this group of ships.

The manner in which these items functioned on the trials of the American Manufacturer was 100 per cent satisfactory and demonstrated ability and skill in the design and manufacturing of the equipment and in its installation and arrangement.

Book Reviews

Revised Regulations for the Transport of Explosives and Other Dangerous Articles, by the Bureau of Marine Inspection and Navigation, Superintendent of Documents, Washington, D. C.; $1.00.

The Department of Commerce has promulgated new and modernized regulations governing the handling, packing, storage and stowing of explosives and other dangerous articles on board vessels, foreign as well as domestic.

These regulations, according to an announcement by the department, are the result of four years of work by the Bureau of Marine Inspection and Navigation in cooperation with the Interstate Commerce Commission, other Federal agencies, port authorities, manufacturers and shippers of such articles, vessel owners and operators and other interested groups, including the railroads and motor carriers.

They are designed to make more effective Article 24 of the International Convention for Safety of Life at Sea by modernizing rules and regulations which had developed more or less haphazardly over a long period of years. As the work of revision proceeded, it was found that the rigid existing statutes covering the handling and shipment of explosives and other dangerous articles required amendment in order to bring them into line with the many changes and advances which have occurred in more recent years.

Because the revising process was the first serious attempt to bring the body of regulations and law into line with modern developments, care was taken to obtain the views of all interested groups. Following thorough consideration, a preliminary draft was issued and widely distributed, and comment and suggestions invited. For a year after, distribution of the preliminary draft conferences were held with various groups in the industry, with the Interstate Commerce Commission and other interested government agencies.

Later a draft of "proposed" regulations was written in the light of facts and suggestions developed. Public hearings were held in Washington last December and the new regulations, embodying certain further changes growing out of the hearing, were promulgated early in January, to become effective April 9.

Some confusion had existed in this field of regulation owing to the fact that the Interstate Commerce Commission for many years past has had jurisdiction over certain classes of vessels and the Commission's regulations were not on all points four-square with those of the Department of Commerce. This duplication and confusion has been eliminated in the revised regulations.

Among other things, the new regulations provide that, for reasons of simplicity and uniformity, definitions of dangerous substances, descriptions, packing, marking and labeling shall be in accordance with Interstate Commerce Commission requirements insofar as they apply to shipment by common carrier by water.

The regulations will be enforced primarily by the Bureau of Marine Inspection and Navigation and the United States Coast Guard.

LLOYD'S REGISTER OF AMERICAN YACHTS

The new issue of Lloyd's Register of American Yachts marks the 39th year of this publication. The book contains particulars of over 7200 yachts, together with a complete list of all owners with their addresses and club memberships, and full details of over 700 yacht clubs.

Signal and radio call letters which have been assigned to yachts listed in the Register are also indicated, and a symbol designating the vessels equipped with radiotelegraphy apparatus makes its initial appearance.

The regular lithographic plates of club burgees and private signals of yachtsmen are not included in the 1941 edition. These flags are normally produced through the London establishment of Lloyd's Register, but difficulties of transit have led to the suspension of this interesting feature.

Many of the great steam yachts of the past, as well as the more modern diesel yachts, have been transferred to the United States Government or to foreign registry, and the particulars of these vessels have been withdrawn from the Yacht Register.

In all early Registers, the steam yacht figures so inconspicuously as to be almost unnoticeable. In the first issue (1872), only ten were entered, some of these being small launches. As the steam division of the fleet increased it was considered necessary to list sail and steam separately, this custom being followed in the first edition of the American Yacht Register in 1903. In the course of time, the steam engine was faced with a competitor, the internal combustion engine running on gasoline, and the term "steam and power" was introduced. When the book was revised and enlarged in 1906 this distinction was eliminated and all yachts entered in alphabetical order. An analysis of the 250 yachts added this year discloses that only ten of the group use sail as the sole propelling power.

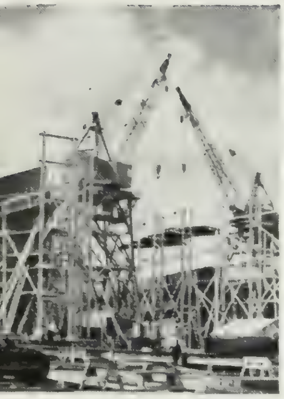
Of the old yachts the most notable is Undercliff, built as Thetis in 1884, a so-called "compromise cutter," designed by her owner, Henry Bryant. She disappeared from yachting in 1915, being used as a fisherman but she returns to the Register this year as an auxiliary schooner, her 57 years of work and play paying tribute to her builder, W. B. Smith, one of the old-time craftsmen.

Of the new yachts, the largest is the steel power yacht Haida, 127 feet overall, with two oil engines, designed by John H. Wells and built by Robert Jacob, Inc., for Max C. Fleischmann. Next in size is Vagrant, the most recent development of the new sail-and-power type.

As for the majority of the 250 new yachts of 1940-1941, they include 80 auxiliaries, mainly yawl and sloop, with over 150 cruising power craft. We look in vain for any sign, not of new "J" boats, but of sailing craft of any size designed for racing.

As to power, the gasoline engine still claims precedence, with only 27 oil installations. The demand for speed is indicated by the 110 twin-screw installations.

The Register will be published as usual in two bindings, the blue cloth at $14.00 per copy and the canvas at $12.00.



On the Ways -
SHIPS IN THE MAKING

LATEST NEWS FROM AMERICAN SHIPYARDS

Contracts for 123 Standard Type Ships

On May 26 the Maritime Commission announced contracts for 123 vessels at an approximate cost of $312,000,000. Cleared with the Office of Production Management, the contracts were for the standard designs developed in the Commission's long-range program with which shipbuilders have had extensive construction experience.

At the same time, the Commission announced contracts for eight shipways and other facilities costing approximately $6,000,000 to be used for construction of a portion of these ships.

The contracts were awarded as follows:

For ships:

Yard	*No. & Type*
Ingalls Shipbuilding Corp., Pascagoula, Miss.	6 C-3's
Federal Shipbuilding & Dry Dock Co., Kearny, N. J.	24 C-2's
Pennsylvania Shipyards, Inc., Beaumont, Texas	10 C-1's
Pusey & Jones Corp., Wilmington, Del.	10 C-1's
Sun Shipbuilding & Dry Dock Co., Chester, Pa.	10 C-2's
Western Pipe & Steel Co., San Francisco	17 C-3's
Seattle-Tacoma Shipbuilding Corp., Tacoma, Wash.	30 C-3's
Moore Dry Dock Co., San Francisco	12 C-2's
Consolidated Steel Corp., Los Angeles	4 C-1's
Total	123

Shipways and other facilities:

Yard	*No. of Ways*
Western Pipe & Steel Co., San Francisco	2
Moore Dry Dock Co., San Francisco	1
Pusey & Jones Corp., Wilmington, Del.	1
South Portland Shipbuilding Corp., South Portland, Me.	4
Total	8

Emergency Shipbuilding Progress

America's emergency ship construction program, which was put under way in March by the United States Maritime Commission with contracts for 200 EC-2 cargo vessels, is well ahead of schedule.

One instance is the Bethlehem-Fairfield Shipyard, Inc., Baltimore, Maryland, where the second keel for a Liberty Fleet ship was laid May 16. The keel-laying had been originally scheduled for June 3. The same yard laid the first keel on April 30, nearly half a month ahead of the scheduled date of May 12.

At the yards of the Oregon Shipbuilding Corporation, Portland, Oregon, keel was laid for one of the emergency ships on May 19, which is the 100th anniversary of the laying of the keel of the first ship ever constructed in Oregon.

Two keels have been laid in the yards of the California Shipbuilding Co., at Los Angeles. One set for June 2 was laid May 23, and the second was moved up from June 12 to May 24.

Similar progress is being made in the construction of facilities and vessels contemplated by the President's order for 212 ships to be turned over to Great Britain under the loan provisions of the Lease-Lend Act. Of this number 112 are of the EC-2 type.

Materials and equipment for all of these emergency ships are being obtained through centralized purchase and thus far, according to the Commission's announcement, little delay has been encountered in procurement and efforts are being made to prevent any delay in the future.

Work on the vessels is proceeding as rapidly as ship ways are made available and in advance of the completion of the yard's general facilities. Ordered in February of this year, the seven new shipyards are in stages of completion ranging up to 75 per cent.

Based upon reports of progress being made, it is expected that the first cargo carriers of this type will be completed by November, fully a month ahead of first completion dates in the contracts.

Contract for One 113-foot Cutter

Coast Guard headquarters announced May 31 that the bid of the Avondale Marine Ways, Inc., Avondale, Louisiana, in the amount of $167,450 for the construction of one

American Packer ready for launching at the South San Francisco yard of Western Pipe and Steel Company. This ship is the last of the five all-welded steel motorships building at this yard for the U. S. Maritime Commission and the United States Lines

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*NOTE: STAINLESS STEEL FITTINGS MADE TO ORDER.

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100

113-foot Coast Guard cutter, has been accepted.

The cutter will have a hull of steel and be suitably constructed for Coast Guard duty on the Western Rivers in handling and servicing aids to navigation and rendering assistance in time of emergency. This cutter will have a length overall of 113 feet 9 inches, molded beam of 26 feet, molded depth at side amidships of 6 feet 7 inches, a maximum draft of 4 feet, and displacement, at the maximum draft, of about 220 tons. The main propelling machinery will be two diesel engines developing 400 shaft horsepower and driving twin screws. Speed of the ship will be about 10 miles per hour.

* * *

Astoria Marine Low on Cutters

Bids were opened at Coast Guard headquarters on May 20 for the construction of six 180-foot cutters, which will have hulls of steel and be suitably constructed for duty on the coasts of the United States in the handling and servicing of aids to navigation and rendering assistance in time of emergency.

For one cutter, the apparent low bid on a fixed price basis was that of the Penn-Jersey Shipbuilding Corp., of Camden, N. J., in the amount of $712,638. This company was also the apparent low bidder on the basis of constructing two cutters, the price of each to be $691,754. On the basis of constructing three cutters, the apparent low bidder was the **Astoria Marine Iron Works, Inc., of Astoria, Oregon,** bidding $771,900 per ship. On a four cutter basis, the same company was apparent low bidder at $769,850 per ship. On a five cutter basis, the **Hydraulic Supply and Manufacturing Company of Seattle, Washington,** was low with a bid of $1,044,238 per ship. On the construction of six ships, the apparent low bidder was M. L. Gilbert of Jacksonville, Florida, in the amount of $720,000 per ship. Several other bids on an adjusted price and a cost plus basis were received.

These cutters will have a length overall of 180 feet with a beam at the water line of 35 feet and a mean draft of 12 feet. They will have a normal displacement of 935 tons.

* * *

Worthington Honors Loyal Employees

In appreciation of loyal and cooperative service, **H. C. Beaver,** president of **Worthington Pump and Machinery Corporation,** has just distributed more than 2,800 lapel emblems to employees who have completed five years or more of service. Nearly one-half of the total workers employed by Worthington were so honored.

Close to 200 of the group were in the 25 to 29-year class, fifty-four ranged from 30 to 39 years and eleven have been employed for over a half century.

The Worthington organization, entering its 102nd year of service to many fields—and now largely engaged in production vital to National Defense—points with pride to these craftsmen who have helped to build an outstanding record of achievement.

Bath Launches Exceller

Ninth fast cargo vessel constructed for American Export Lines during the last two years and first of four sisters, S. S. Exceller was launched May 10 at Bath Iron Works, Bath, Maine. Miss Henriette "Mickey" Gehan, 10-year-old daughter of the lines' vice president, and Mrs. John F. Gehan of New York, was the sponsor.

A special pullman train carried more than 100 guests and officials of the lines from Washington and New York to Bath. Among those aboard were W. H. Coverdale, president American Export Lines, and Mrs. Coverdale; J. E. Slater, executive vice president, and Mrs. Slater; John F. Gehan, vice president, and Mrs. Gehan; and Major H. M. Gillespie, vice president and secretary-treasurer, and others. Also attending were J. E. Schmeltzer, director emergency ship construction division of the Maritime Commission, and Mrs. Schmeltzer; J. J. Dempsey, commissioner U. S. Maritime Commission, and Mrs. Dempsey; J. W. Slacks, financial assistant to chairman, and Mrs. Slacks; Mr. and Mrs. F. M. Darr, Mr. and Mrs. C. G. Cornwell, and Mr. and Mrs. F. B. Goertner, all representing the Maritime Commission.

The Exceller, rated at 6,650 gross tons, capable of carrying 7,550 deadweight tons, reflects many characteristics new to the American Merchant Marine vessels of its general class.

Sponsor's party at the launching of American Export Lines' S. S. Exceller. In the rear from left to right: Commissioner J. J. Dempsey, U. S. M. C.; Mrs. F. J. Gehan; F. J. Gehan; Mrs. J. J. Dempsey; Miss Rosemary Matz; John F. Gehan, vice president American Export Lines; Miss Irene Gehan; and Miss Irene Matz. In the front row: Mrs. John F. Gehan; Henriette Gehan, 10-year-old sponsor of the Exceller; Elizabeth Mullen; and Commander J. M. Kiernan, U. S. N.

Her principal dimensions are:

Length overall, 420 ft. 0 in.; breadth molded, 60 ft. 0 in.; depth molded amidships, 39 ft. 4 in.; designed draft molded, 27 ft. 6 in.

She is expected to develop 8,000 horsepower at the normal speed of her cross compound double reduction geared turbines. A sustained sea speed of 16½ knots is anticipated. The cruising radius is figured at 12,000 miles. A full scantling type with three decks providing space for 407,500 cubic feet of general cargo in six holds, the hull construction makes extensive use of welding. The steel house amidships provides spacious and well ventilated quarters for officers and crew. Hull construction is fireproof throughout and is equipped with the most modern fire-fighting and detection apparatus. Three of the six holds are equipped with Cargocaire for conditioning certain kinds of semi-perishable cargo in transit.

Bethlehem Launches S. S. Corsicana at Sparrows Point Yard

At one o'clock noon, April 19, the Corsicana, latest addition to the fleet of Socony-Vacuum Oil Company, slid down the ways at the Sparrows Point, Maryland, Yard of Bethlehem Steel Company. Mrs. Edwy Rolfe Brown was the sponsor.

The Corsicana, the keel of which was laid on August 12, 1940, has a deadweight of 16,000 tons and a tank capacity of 129,000 barrels, or 5,418,000 gallons of oil. The cargo space is divided into 24 compartments, allowing many different grades of oil to be carried at one time. Pumping capacity is designed to load or unload the vessel in about 16 hours.

The principal dimensions of the Corsicana are as follows: Length, over-

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FOOT OF SCHILLER STREET
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**GENERAL ENGINEERING
and DRY DOCK COMPANY**

all, 501 ft. 4½ in.; breadth, molded, 68 ft.; depth, molded, 37 ft.; draft, loaded, 29 ft. 8½ in.

The new tanker is a single screw vessel equipped with steam turbines. Steam is supplied by two oil-fired water tube boilers.

Extensive use of welding and application of the Bethlehem-Frear system of construction to longitudinals and bulkheads have produced a light, yet strong framing with a substantial increase in paying deadweight for the given displacements. The vessel is of the conventional tanker appearance with separate forecastle, midship navigation bridge, and poop, connected by the usual cat walk. Raked stem and cruiser stern give the vessel a pleasing ship-shape appearance.

◆

S. S. Lansing Back To Britain

A 51-year-old floating fish reduction plant, the steam screw Lansing, built in 1890 at Newcastle, England, and formerly owned by the Fishermen's Produce Company, Inc., San Francisco, California, was sold recently to the W. R. Carpenter Oversea Shipping, Ltd., Sydney, Australia, with transfer to British registry and flag.

The fish factory was a tanker for many years and was acquired by the present owner in 1932 from the Union Oil Company and used as a fish reduction barge on San Francisco Bay.

California law now discourages operation of floating fish reduction plants and the vessel had been idle for two years with no offers. W. R. Carpenter Oversea Shipping, Ltd., spent $150,000 for the vessel and is expected to spend more than $200,000 in reconditioning her for operation in trade between the United States, Canada, Australia, New Guinea and Pacific islands.

The Lansing has a speed of 10 knots; deadweight tonnage 7,458; gross tonnage 4,613; and length 89.4 feet.

Mrs. Richard J. Reynolds with Robert Haig, vice president of Sun Shipbuilding and Dry Dock Co., in attendance registers a good smash on the nose of China Mail

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QUEEN INSURANCE CO.
MARITIME INSURANCE CO., LTD.
FIDELITY PHENIX FIRE INS. CO.
Commercial Hull Dept.
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Offices at: Colman Bldg., Seattle · 111 West 7th St., Los Angeles

Marine Accident Prevention

Pacific Coast is justly proud of its accident prevention work on docks and ships. Coastwise contests for best safety records are a part of this activity. Byron O. Pickard, Chief Safety Engineer of the Accident Prevention Bureau of the Pacific Coast Marine Associations, reports that the following vessels have won safety pennants under the rules of the 1940 Vessel Safety Contest:

Passenger Vessels

Class "A"
SS President Coolidge
American President Line
Class "B"
No vessel qualified
Class "C"
No vessel qualified

Freighters

SS Kahuku, *SS Liloa, SS Makaweli, *SS Makiki, SS Manulani, SS Maui, SS Maunawili, Matson Navigation Co.

SS C. R. McCormick, *SS West Portal, SS West Cactus, SS West Camargo, SS West Notus, SS West Nilus, McCormick Steamship Co.

SS Oduna, Alaska Steamship Co.

SS Staghound, Grace Line.

Steam Schooners

SS H. F. McCormick, McCormick Steamship Co.

*SS Scotia, P. L. Transportation.

*SS Lurline Burns, Burns Steamship Co.

SS Oliver J. Olson, *SS Barbara Olson, *SS Florence Olson, *SS George Olson, SS Whitney Olson, Oliver J. Olson Co.

*These vessels worked the entire year without any reported disabling occupational injuries to any member of the crew.

SHIPOWNER COMPANY SAFETY AWARDS 1940

First Place
Steam Schooner Division
P. L. Transportation Co. and Burns Steamship Co. tied for first place.
Freighter Division
McCormick Steamship Co.
Passenger Division
Class "A"—Matson Navigation Co.
Class "B"—American President Line
Class "C"—No Award

Special Recognition
Steam Schooner Division
Oliver J. Olson Co.

An Improved Marine Radiotelephone

A new marine radiotelephone so flexible in design that at the flip of a switch a vessel can communicate with any shore station serving U. S. territorial waters—either inland or seaboard—has been announced by the Western Electric Company for use aboard towing, fishing, and pleasure craft.

Known as the 226-D, the new instrument features instantaneous selection of any one of ten pre-tuned frequencies, quartz crystal control of both transmission and reception, extreme signal clarity, low noise, and semi-automatic operation.

Simplicity keynotes the new design. Installation involves connection only to antenna, ground and power supply. The compact cabinet lends itself to mounting on a bulkhead, shelf, a locker top or other convenient support. Only three control knobs appear on the panel and the transmitter goes on the air at the pressure of a finger on the handset button. Anyone can make a call with the new unit without previous instruction although, because it involves radio transmission, the law requires the presence aboard of a licensed (3d class) operator.

A single control is provided for shifting both the transmitter and receiver simultaneously to any one of ten frequencies. Nine of these may be utilized for ship-to-shore communication and the tenth reserved for ship-to-ship or coast guard. All controls are located on the front panel where they may be reached easily.

The radio receiver is of the superheterodyne type embodying the latest developments in circuit design.

The handset is of the most advanced type available today. When not in use, it rests on a small hanger on the side of the cabinet. Returning the handset to its hanger automatically prepares the receiver for the next incoming call. Additional telephone instruments may be installed at selected locations about the vessel. A built-in loudspeaker monitors incoming calls, if desired, and both a selective calling device, which permits the shore station to ring the boat, and a precision radio-compass attachment are optional.

The 226-D operates on 110 volts, 60 cycles, ac which may be supplied by a small, inexpensive rotary converter. Due to the variations in ship electric power supply systems, the converter is not included as part of the equipment. Converters are available to operate from 12, 24, 32, or 110 volt dc ship power supply systems. With a source of ac supply thus available on the boat, a standard broadcast radio receiver may also be operated should the owner wish to receive broadcast programs.

Keep Posted!

Recent Development in Ship, Yard and Dock Equipment

Steel Locker Units

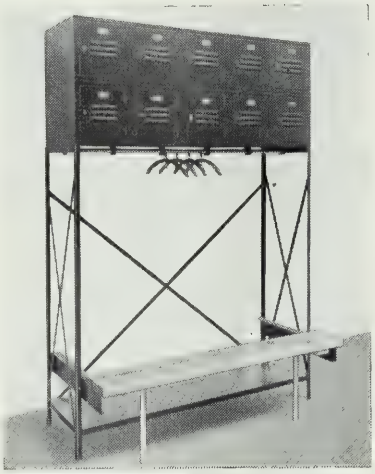
Illustrated is a group of steel constructed lockers, designated as the Penn-Kelsey Unit, which provides complete facilities for ten persons in half the floor space ordinarily required. Such an arrangement of lockers releases extra floor space for productive purposes and provides maximum ventilation.

Each low-cost, portable unit has an open coat space 56½″ high with the coat hangers permanently attached to the rod. There is a perforated metal shoe rack at bottom, a wooden seat, 8½″ wide and 18″ above the floor, attached to the frame, and ten private, locked compartments, each of which is 12″ wide, 18″ deep and 12½″ high.

Doors are flanged on all sides for strength, with three ventilating louvres per door. Optional locking arrangements are a flat key lock with bevel spring-bolt or dead bolt, a spring-bolt combination lock or a padlock.

Heavy furniture steel is used in the assembly, with compartment door frame members spot welded for strength and rigidity. Nuts and bolts are cadmium plated to resist corrosion. Rubber bumper silencers are employed at contact points.

Overall size of each unit is 60″ wide, 18″ deep and 87″ high, accommodating ten persons.



Penn-Kelsey locker unit

Exactor Hydraulic Remote Control

Sperry Products, Inc., are manufacturing a line of hydraulic remote controls that are accurate to a fraction of a degree, positive in their action, economical in cost and in maintenance, and very simple in their design and installation.

Specifically these controls include a transmitter, a receiver and connecting tube. When the system is filled with liquid, any movement of the transmitter handle is faithfully reproduced on the lever arm of the receiver.

The uses for such control aboard ship are obvious. By means of its accurate and positive transmission of motion, all the controls of main engines, auxiliary generators, refrigerator plants and other machinery, may be brought to a central point directly under the supervision of the engineer on watch.

Exactor hydraulic control is an ideal mechanism for the bridge-engine room telegraph transmission. A three-sixteenth-inch copper tube makes the connection.

This control transmission has several very decided advantages among which are:

(1) No backlash or lost motion.
(2) No creeping.
(3) Self synchronization.
(4) Safety.

Many of these controls are in use on naval and mercantile ships, on military and commercial aircraft, and on railroad equipment.

Boiler Water Control on High Pressure Steam Plants

On eleven of the new steamers which had entered service this year, up to the end of April, the high-pressure boilers are guarded against scale and corrosion by simultaneous control of excess phosphate and alkalinity in the boiler water according to the Hall System.

The Thompson Lykes, delivered April 25 to the operators from the Sparrows Point Shipyard of the Bethlehem Shipbuilding Corporation, and the John Lykes, are the twelfth and eleventh, respectively, of the Lykes vessels which have entered service with the Hall System, under the supervision of the Maintenance Engineering Corporation, Bull & Roberts representatives at Gulf ports.

The Alcoa Pioneer recently arrived in New York on its initial voyage from the West Coast, where she was delivered to the operators by the Union Plant of the Bethlehem Steel Corporation on March 25. She was handled as to water conditioning during her trials under the supervision of Clyde Williamson, service engineer of the Griffin Chemical Co., Bull & Roberts representatives at California ports, and in future service will be looked after by Bull & Roberts, the same as the Alcoa Pathfinder and the Alcoa Prospector, which entered service in February and March, respectively.

The new high-pressure steam tanker Virginia, of the National Bulk Carriers, which recently completed her first voyage by arrival in New York, entered service with the Hall System, as did all previous high-pressure vessels of this fleet.

The two new vessels of the Robin Line of the Seas Shipping Co., the Robin Locksley and Robin Doncaster, began service using the Hall System. Robin Doncaster has since been transferred to British registry.

The entire fleet of the American President Lines in the around-the-world and transpacific services, including the President Hayes and the President Garfield, completed by Newport News since the beginning of the year, have the Hall System.

All four of the Matson Navigation vessels nearing completion at the yards of the Federal Shipbuilding & Dry Dock Co. and of the Newport News

Shipbuilding & Dry Dock Co., which are to run direct from Atlantic ports to Hawaii, are to be operated under the Hall System. Of these, the Hawaiian Merchant has just been delivered at Kearny.

New Plastic Product

Due to the priority demands of the National Defense Program, the aluminum mills of America are unable to continue the supply of material to fabricators of aluminum products in the commercial fields.

In view of this situation, the R. D. Werner Company, Inc., of New York, finishers of extruded metal molding, recently announced a new line of plastic products under the trade names "Plastikmould" and "Plastiktrim."

These new plastic products are manufactured in a wide range of colors in similar shapes and sizes as now supplied in aluminum; also rods, tubes, and other commercial items both flexible and rigid.

P. C. Goodspeed, who has had many years' experience with plastics, is in charge.

Vibration Service Lamps

To overcome vibration, jar and shock which ordinarily seriously impair the efficiency and life of electric light bulbs, the Wabash Appliance Corporation, Brooklyn, N. Y., has announced a new type of vibration service lamp whose construction protects the filament from vibration and jar. It is designed particularly for industrial and commercial use where high frequency vibration set up by motors and machinery tend to weaken the average bulb filament and shorten its life span considerably. It is recommended also for use where early burn-outs are caused by vibration set up by rumbling trucks, as in store windows, and for use in hanging fixtures that might be subjected to accidental jolts, shocks and other rough usage.

Vibration service lamp

In appearance it has the same overall length as an ordinary bulb, but is made in a larger oversize bulb of wider diameter to increase the convectivity of the heated argon and nitrogen gases inside the bulb, thereby allowing the lamp to burn considerably cooler. The filament of the new lamp is cushioned against shock and concussion of vibration by four molybdenum pigtail springs welded to six flexible filament supports. The entire stem unit has been shortened and made flexible. To increase lighting efficiency a nickel neck reflector disk welded to a seventh support serves to reflect light away from the neck of the bulb, while a center piece of mica insulates the wire supports from the disk and helps keep heat away from the base.

The new lamp will be made in the 100, 150 and 200 watt sizes in five separate low voltages from 110 to 130 volts, and in four separate high voltages from 220 to 250 volts. Standard finish will be either inside frosted or clear. Average burning life will be 1,000 hours.

Reflector Lamps Now Available in High Voltages

Industrial plants generating their own electric current, will be especially interested in the new "sealed-silver" high voltage Birdseye Lamp that the Wabash Appliance Corporation has just begun to manufacture.

This new lamp is made with its own built-in reflector unit in the form of a solid silver lining hermetically sealed inside the bulb where it cannot gather dust, or tarnish, crack or peel as is often the case with separate bulb and reflector combinations. A nickel neck reflector disk redirects light that would ordinarily be wasted through the neck of the bulb.

The combination of neck reflector disk, pure silver lining and exact optical placement of the filament is said to direct a concentrated flood of light rays straight out of the bulb direct to the work area to be illuminated.

These new lamps are being made in six sizes from 100 to 1,000 watts, and in seven different high voltages from 220 up to 300 volts.

1200-lb. Steam Auxiliary Turbines

Two 350-kilowatt, dual-pressure turbine-generators built by the General Electric Company for American Export Lines' Examiner are designed to take steam from the main boiler at 1200-lb pressure, about double the previous top steam pressure for American marine auxiliary sets.

They will operate at the 1200-lb initial pressure when the vessel is in port and the main turbines are shut down, taking steam direct from the main boilers to generate power for loading and unloading.

In supplying auxiliary power for normal operation at sea, the two dual pressure units will use low-pressure steam ranging from 130 to 245 lb per sq inch gage. This will be taken from the cross-over connection between the high and low pressure main propulsion turbines and reheated, thereby obtaining the best over-all heat balance. The total temperature of the inlet steam at both conditions will be 740° F.

The change-over from low to high pressure steam is completely automatic. Each of the dual-pressure units is equipped with two steam inlet connections. The one for 1200-lb steam has a 1¼-in inside diameter. This throttle valve controls a group of nozzle ports located in the lower half of the high-pressure head through a single throttling-type governor valve. The three-inch inside diameter low-pressure throttle valve controls, through a set of six governing valves, six separate groups of nozzle ports located in the upper half of the high pressure head.

It is expected that the units will operate on low pressure about two-thirds of the time. For this reason, the low-

(Page 100, please)

Running LIGHTS

Who When Where

What Your Friends Are Doing

The Navy called Lieut.-Comdr. C. W. Eshom, traffic manager of the Blue Star Line in Seattle, to active duty. He will be put in command of the U. S. S. Tatoosh, soon to be put in service as a Navy supply, repair and patrol ship.

◆

Illness caused Hal W. Forsey to resign from his position as controller of Enterprise Engine & Foundry Company, San Francisco, in May. The announcement came from Capt. C. S. McDowell, president of the company, who also stated that E. F. Asher will temporarily fill the position.

◆

Early in May **Dr. Henry F. Grady,** president of the American President Lines, was elected a member of the board of directors of the Wells Fargo Bank and Union Trust Co. of San Francisco.

◆

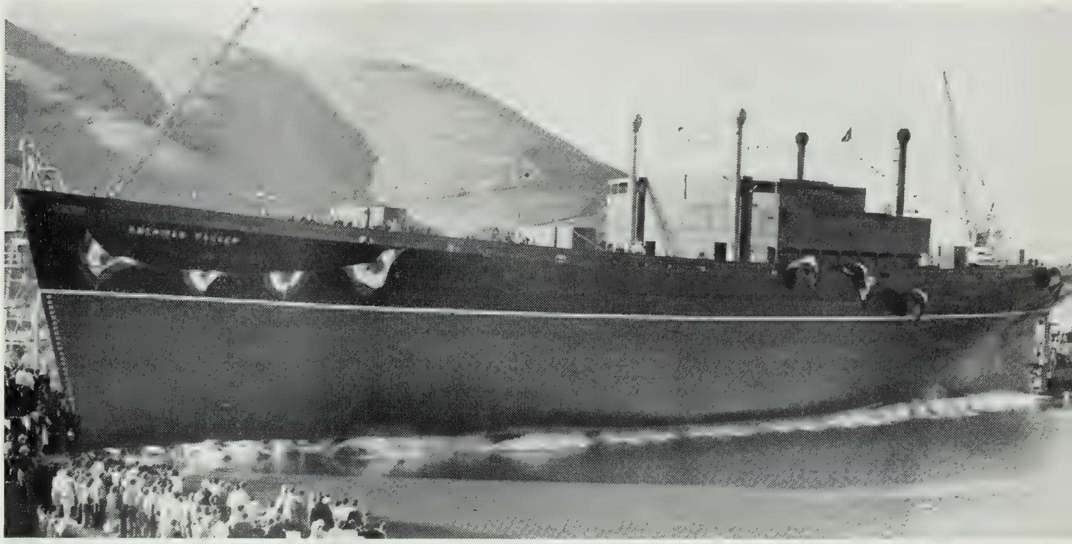
Albert V. Moore, president of the Moore-McCormack Lines, announced on May 7 that Captain Axel Pearson had been appointed commander of Independence Hall of the company's Pacific Republics Line service. Capt. Pearson last served as chief officer on the cargo liner Mormactern.

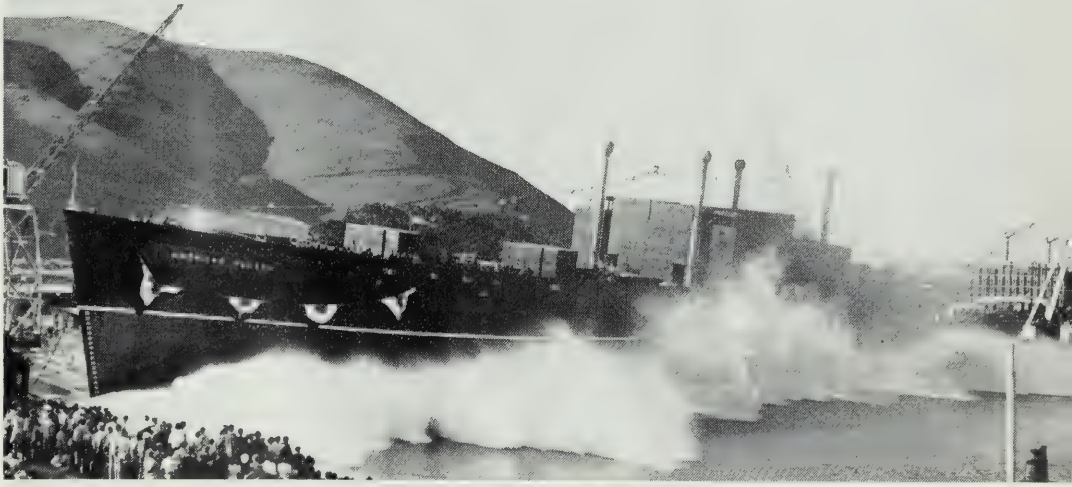
◆

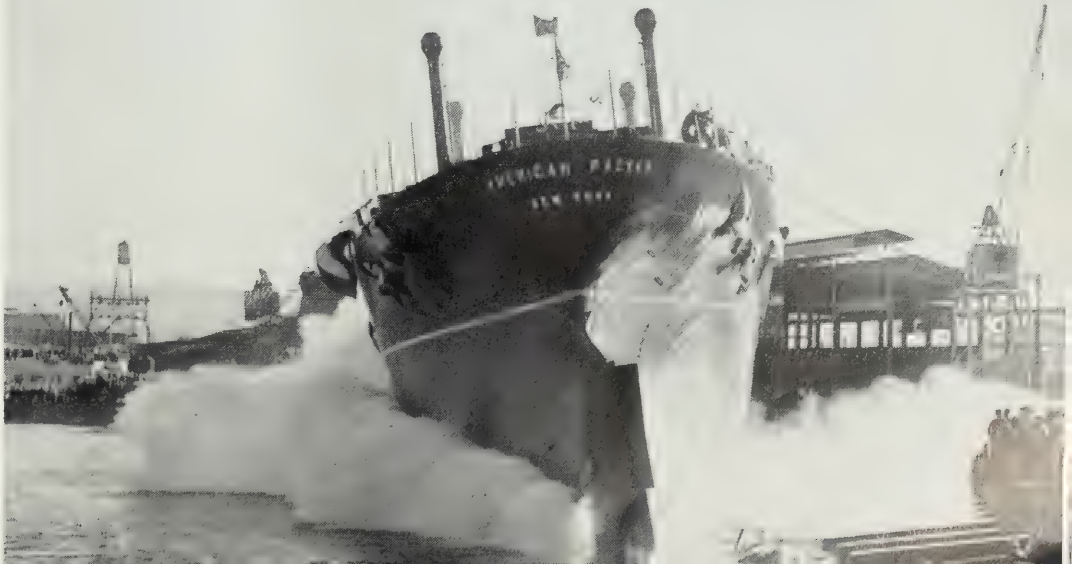
The California Association of Port Authorities elected the following officers at their May meeting to take office for the coming year: J. F. Marias, president; W. D. Lamport, vice president; M. D. McCarl and Fred D. Parr, re-elected secretary and treasurer, respectively.

Captain Henry Nelson, master of the S. S. President Coolidge, flagship of the American President Lines fleet, is here being congratulated by company President Henry F. Grady during a colorful flag-raising ceremony aboard the President Coolidge. The flag is the Safety Award Pennant, awarded each year by the Accident Prevention Bureau of the Pacific American Steamship Owners Association, to the vessel with the lowest number of disabling occupational injuries among ship personnel. The President Coolidge, the only passenger vessel to be thus honored for 1940, has won the Safety Award for two successive years. The ceremony was held at the home port of San Francisco on Tuesday, May 13

Picture Story of the American Packer Launching







Present at the spectacular side-launching of the U. S. Maritime Commission C-1 Motorship American Packer was Capt. Howard L. Vickery, Commissioner out from Washington, D. C. as honor guest of San Francisco in observance of National Maritime Day.

On the opposite page (left view), Sponsor Mrs. Angelo Rossi, wife of San Francisco's Mayor, is seen ready for the big moment, while President Howard Tallerday of Western Pipe & Steel Company watches intently. Right view shows impact of glass on steel, as ship starts her thrilling lunge which the three progressive photos depict so graphically.

The launching party in the lower view on the facing page: J. E. Schmeltzer, director, E S C D, U. S. Maritime Commission, Mrs. Rossi, Capt. Vickery and Mr. Tallerday.

News of the Propeller Clubs of the United States

The Port of San Francisco

Charles L. Wheeler
President
John E. Cushing
First Vice-President
Arthur B. Poole
Second Vice-President
Hugh Gallagher
Third Vice-President
Eugene F. Hoffman
Secretary-Treasurer

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Marshall Levis
Ira S. Lillick
Capt. Lewis Mesherry
Joseph A. Moore
Arthur B. Poole
Charles L. Wheeler

Port of San Francisco

National Maritime Day was an active one for Port of San Francisco "propellers." With co-sponsors including the Senior and Junior Chambers of Commerce, and the San Francisco Commercial Club, the organization staged the brilliantly successful luncheon where Captain Howard L. Vickery, head of the Maritime Commission's shipbuilding program was principal speaker.

Chairman of the sponsoring groups was William A. Baxter, aided by Propeller Club secretary Eugene Hoffman and House Committee Chairman Byron Pickard. Les Houdlette and E. N. Hunter also served.

Captain Vickery made a stirring address which is commented on editorially in this issue of PACIFIC MARINE REVIEW. The honored speaker is also seen in action on the front cover of this volume.

The luncheon brought out a maximum attendance with West Coast Naval, Federal, State, ship operating, shipbuilding and traffic leaders comprising the audience.

Later on the same day, the San Francisco Propeller Club played host at an informal reception in honor of the distinguished visitor. The event proved a very pleasant and relaxing "time out" for the Commissioner and he very graciously complimented his hosts on the well-ordered affair, stating that it was, "one of the most pleasant experiences of my long journey."

Announcements are in the mails calling your attention to the Final Spring Round Up!

The pre-vacation date is Wednesday, June 11th, and the Comstock Room, Palace Hotel, is the setting.

Guest speaker will be Commander R. B. England, personnel officer, U. S. Navy Yard at Mare Island.

This program will also take due notice of the club's second birthday anniversary with appropriate ceremonies.

Port of Los Angeles

National Maritime Day, annually proclaimed by the President of the United States as May 22, commemorating the first Atlantic crossing by a steamer, the S.S. Savannah in 1819, was fittingly observed in Southern California by a civic luncheon sponsored by the Propeller Club of the United States, Port of Los Angeles No. 66, held at the Biltmore Hotel on May 22, 1941.

Speaker at this noted occasion was Rear Admiral Albert Ware Marshall, USN (ret), former commander of the Air Squadrons of the United States Fleet. The Ballroom of the Biltmore was decorated with house flags of American merchant marine lines.

Ralph J. Chandler, resident manager for the Matson Line and president of the Los Angeles Propeller Club, extended an official welcome to the 300 shipping, business and civic leaders gathered for the meeting. Fred A. Hooper, district manager for the American-Hawaiian Line, ably presided as chairman of the day.

Guests at the speaker's table included many noted shipping men such as John Eidom of the Hancock Oil Company and president of the Bilge Club; Perry S. Newcomb, Pacific Coast manager of the Barber Line and president of the Los Angeles Steamship Association; Harry J. Summers, principal surveyor for the American Bureau of Shipping and vice-president of the Propeller Club; Eugene Overton, president of the Board of Harbor Commissioners; Arthur Eldridge, general manager, L. A. Harbor; Otto Miller, chief deputy collector of customs; Lieut.-Commander W. W. Feineman, USN, Neutrality officer at Los Angeles Harbor; W. R. "Frosty" Martin, president of the Long Beach Harbor Commission; W. D. Fraser, general chairman of the Foreign Trade Week Executive Committee and the winner of the 1941 plaque for the individual who has contributed most to foreign trade during the past year; Francis J. McGowen, president of the Waterfront Employers Association of Southern California and many others too numerous to mention.

Los Angeles Nominates

Nominations for the 1941-42 officers of the Propeller Club, Port of Los Angeles No. 66, were given to President Ralph J. Chandler recently. Fred A. Hooper, district manager for American-Hawaiian Steamship Company and first vice-president of the Club, was nominated to succeed Mr. Chandler as president. Edgar M. Wilson, district manager for the American President Lines, was nominated for the first vice-president; Harry J. Summers, principal surveyor for the American Bureau of Shipping, for second vice-president and James L. Adams, attorney for the firm of Lillick, Geary, McHose and Adams, third vice-president.

Norman Dunnavant, publisher of the *Daily Shipping Guide* and the *Commercial News,* was nominated to fill the office of secretary-treasurer.

Directors nominated for the three year term expiring June 30, 1944, were Mr. Adams, and Charles H. Bayly, Crescent Wharf & Warehouse Company; J. B. Hurd, Matson Line; Captain I. C. Johnson, USN (ret), director of the 11th Naval Reserve District; L. K. Vermille, Admiralty attorney with the firm of Overton, Lyman and Plumb; Howard H. Wickersham, manager of W. H. Wickersham & Co.; and R. W. Gearhart, contracting manager for Consolidated Steel Corporation.

The annual election will be held at the June meeting.

Port of Tacoma

The regular monthly meeting of the Propeller Club, Port of Tacoma, was held Tuesday evening, May 20, with dinner at 8 p. m. at the Tacoma Club.

Previous to the dinner hour, the members met at 6:30 p. m. at the yard of the Seattle-Tacoma Shipbuilding Corp. and were taken on a personally conducted tour which was very interesting and much appreciated by those who availed themselves of this opportunity. This tour was arranged by our president, Gil Ackerman, who is associated with this shipbuilding concern.

The members went direct from the shipyard to the Tacoma Club where cocktails were served to over sixty members and guests, this being an even greater attendance than our last month's meeting.

Pres. Ackerman called the meeting to order and he immediately called on Mr. Dave Neilson of the U. S. Maritime Commission, Tacoma, to introduce five guests from San Francisco. These men, who are also with the U. S. Maritime Commission and who came north for the trial run of the new MS Cape Flattery, just completed at the local yard, were as follows:

J. W. Massenburg, Senior member of the trial board; A. B. Cecil, marine engineer and member of the trial board; E. R. Stigen, associate marine engineer and member of the trial board; E. E. Humphrey, hull construction coordinator; and E. S. Birnbaum, surveyor.

The Club was honored by having these gentlemen from San Francisco as their guests.

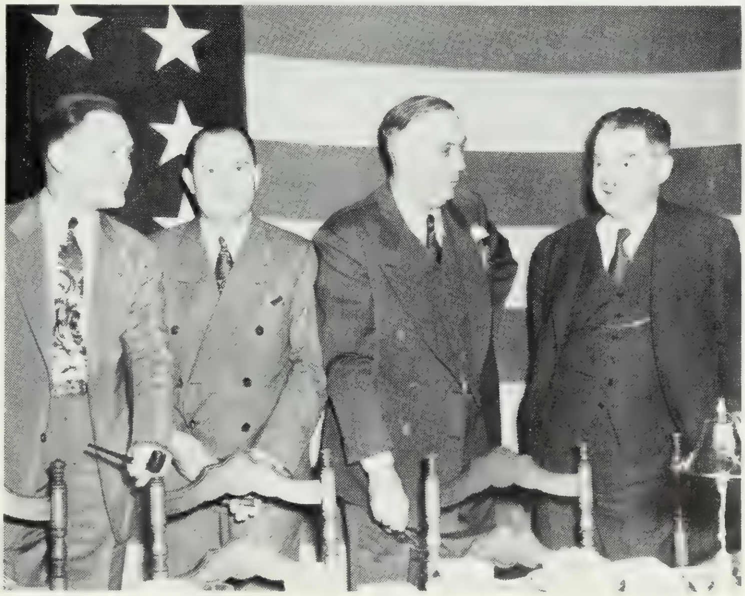
Immediately following the above introductions, the president called on Alex Stewart, secretary of the Seattle Propeller Club and Northwest manager of *The Log,* to introduce the other Seattle guests. They included:

Edward Cunningham, Pacific Marine Supply Co.; Ralston Cunningham, Ralston Cunningham Co.; M. J. Klepser, Nordby Supply Co.; I. Lynn Miller, Nordby Supply Co.; and Larry Smith, Miller-Freeman Publications, Inc.

Ken Kennell, as chairman of the membership committee, was asked to report on new members admitted to the Club since the last meeting. They are as follows:

Tom Manley, Olson Tugboat Co.; W. J. Kear, Sperry Flour Co.; L. J. Rogers, Weyerhaeuser Steamship Co.; F. A. Hoffman, Ledoux & Co., New York City; M. J. Heidner, Heidner & Co.; Jas. T. Akehurst, Wypenn Oil Co., Inc.; E. Arthur Erickson, Tacoma Smelter; A. W. Taylor, Standard Oil Co.; and Hervey M. Petrich, Western Boatbuilding Co.

Mr. Massenburg of the Maritime Commission was called on to answer any questions which might be asked of him by the members, after which the meeting, another outstanding one, was adjourned by Mr. Ackerman.



Charter presentation dinner of the Propeller Club, Port of Sabine, at the Goodhue Hotel, Port Arthur, Texas, on April 26th, 1941, drew 150 members and a group of notables. Louis B. Pate (left) of New Orleans, vice president of the west gulf coast region, made the presentation. Arthur M. Tode (second), of New York, honorary president of the national organization, welcomed the new Club. Munger T. Ball (third) of Port Arthur, president pro tem of the Sabine Club and master of ceremonies, accepted the charter. Commander R. S. Field (right) of Washington, director of the Bureau of Marine Inspection and Navigation, was one of the principal speakers

Commander Lee Gives Maritime Day Address

Commander Robert C. Lee, executive vice-president of Moore-McCormack Lines, and president of the Propeller Club of the Port of New York, in an address on May 22 at the Annual Maritime Day dinner of the Propeller Club, urged that American interests forget their differences and combine their efforts to prepare to defend the nation.

In an address which was heard by about 1500 shipping men and guests at the Hotel Astor, Commander Lee said that "there are too many Americans today who are sticking their heads into the sand in the hopes of avoiding danger by refusing to see it." He said also that "the Maginot Line of the 3,000 miles of Atlantic Ocean will prove as useless a defense of the United States as did the Maginot of France prove useless in their defense if we permit cowardice, foreign 'isms,' greed and corruption to rule behind the lines."

Commander Lee urged that the example of the youth of the country who have given up the comforts of homes in return for hard work and low salaries be accepted by the rest of the nation as its ideal. He quoted a survey by Iron Age which showed that the recent coal strike cost the country 300,000 tons of steel, sufficient to build 8,000 tanks, as an example of the present difficulties.

Commander Lee said: "We passed a seven billion dollar appropriation to win this war and then went home and fell into a family squabble as to how we would divide the spoils. This war will not be won by appropriations. We cannot buy ourselves out of the mess this world is in and fortunately there is awakening a spirit in this country that will not long permit this condition to continue.

"There is coming a time when these boys, getting twenty-one dollars a month and drilling with wooden guns because some strike has closed a gun factory, are going to make themselves heard. Some day some of these American boys may find themselves facing death, out of ammunition, because the supply at home has broken down. There is more than one kind of sabotage; there is more than one kind of traitor; but the same penalty should apply to all—the death penalty for traitors, saboteurs, and spies."

Congressman Joseph J. O'Brien, of East Rochester, New York, spoke on the subject "Our Present Merchant Marine," and Arthur M. Tode, Honorary National President of the Propeller Club, acted as toastmaster. The dinner commemorated the 122nd anniversary of the first successful trans-oceanic voyage under steam propulsion by the S.S. Savannah.

The Big Convention In the Making

Following the admonition of General Chairman Edward H. Harms, all hands on the 1941 Convention Committee are already swinging into action with full throttle open . . . despite the fact that the big meet is still several months away.

The able leadership of experienced convention planners like Chairman Ed, Gene Hoffman, Bob Spear strongly augmented by President Wheeler and Honorary President Arthur Tode, is charging the committee heads with unbounded enthusiasm very much in evidence at the frequent meetings of the convention-building "lieutenants."

The entertainment program for the several days of the conference is rapidly taking tangible form. It would be indiscreet on the part of your reporter to steal Bob Spear's thunder by giving details . . . but suffice to say at this early moment that visiting and hosting groups who plan to receive the full measure of mental and recreational profit from this outstanding maritime get-together of 1941 will enjoy many beautifully planned receptions, luncheons, trips and other typically San Franciscan entertainment features.

Entertainment Chairman Spear called the first meeting of his co-workers for April 30th. Present were every man-Jack! Here is the roster:

Robert D. Spear, Chairman, Foster Wheeler Corporation.

George E. Swett, vice chairman, Geo. E. Swett & Company.

Robert S. Abernethy, California Maritime Academy.

Horace T. Beverly, attorney.

Charles G. Cox, Enterprise Engine Company.

Raymond O. Demarest, Sudden & Christenson.

Bernard N. De Rochie, PACIFIC MARINE REVIEW.

Richard H. Glissman, Rutledge-Glissman Company.

Frank E. Lewis, Western Asbestos Company.

D. N. Lillevand, Grace Line.

Capt. W. T. Lion, Moore-McCormack Lines, Inc.

J. F. McConkey, Sperry Gyroscope Company.

Carroll F. Reeves, De Laval Steam Turbine Company.

Clyde Williamson, Griffin Chemical Company.

At this meeting General Chairman Harms outlined tentative convention program plans with accomplishments to date.

Three stalwarts of 1941 Convention Committee: Robert Spear (left), Entertainment; General Vice Chairman Eugene Hoffman; and K. C. Tripp, Registration

During the ensuing four weeks remarkable strides have been taken, and all is progressing in a most satisfactory manner.

Other department chairmen are doing valiant work as well. Impressed with the responsibility with which they have been entrusted these men are giving their time, their talents and best study to the job of making the San Francisco Convention a complete success:

General Chairman, Edward H. Harms, McCormick Steamship Co.

General Vice Chairman, Gene Hoffman, American President Lines.

General Secretary, John Davidson, American-Hawaiian S. S. Co.

General Treasurer, C. M. Le Count, General Electric Co.

Reception, Joseph F. Marias, Board State Harbor Commissioners.

Registration, K. C. Tripp, Moore-McCormack Lines.

Hotel and Banquet, Capt. Lewis Mesherry, Army & Navy Club.

Entertainment, Robert D. Spear, Foster Wheeler Corp.

Golf, Joseph A. Lunny, McCormick Steamship Co.

Publicity, Bern DeRochie, Pacific Marine Review.

Exhibits, William Radner, Matson Line.

Finance, Arthur B. Poole, American President Lines.

Printing, W. Edgar Martin, Westinghouse Electric Co.

Transportation, Robert Fouke, Admiralty Attorney.

Golfers

The Association of Marine Underwriters of San Francisco, organized December 17, 1885, held its Twelfth Annual Golf Tournament and Dinner at Sequoyah Country Club on Thursday, May 22, 1941.

The tournament was divided into two classes according to handicap and there was a separate guest flight with suitable prizes in each division, together with dinner prizes.

Colored movies taken of the tournament and the movies of previous tournaments were shown at the dinner held in the evening.

The golf committee consisted of: Russell A. Mackey, R. R. Murphy, R. J. Lutich, J. F. Fayen and T. B. Dean.

Matson Navigation Company
727 West Seventh Street
Los Angeles, California

March 14, 1941.

Mr. Bernard N. DeRochie, V.P.
Pacific Marine Review
500 Sansome St.
San Francisco, Calif.

Dear Mr. DeRochie:

I wish to thank you for your letter of March 6th, enclosing tear sheet from the current issue of Pacific Marine Review, calling attention to the article entitled "Pacific Coast Men on American Bureau of Shipping."

Yours is a fine publication and it presents interesting and educational reading matter.

As President of The Propeller Club, Port of Los Angeles No. 66, I appreciate your cooperation in recording the activities of our Club and wish to take this opportunity to thank you.

Very truly yours,

(Signed) R. J. Chandler,
President, Port of Los Angeles,
Propeller Club of the United States.

"Grandpappy"

Mollifying Our Mascot—

Anybody and everybody who is participating in the elaborate committee work for the Propeller Club Convention and American Merchant Marine Conferences of 1941 knows about Grandpappy.

The boys were almost ready to adopt him as chief mentor, Cicero and counsellor, but recent irascible outbursts of mountain temperament on the old gent's part have suggested the safer course of naming him our mascot and talisman. So be it!

Everything was going along smoothly until all those photos of Propellers from Los Angeles and San Francisco appeared in the public prints last month. Our readers will remember the Del Monte delegates whose features lent zest to our last edition.

Imagine our chagrin when we received the following cryptic letter one otherwise pleasant Tuesday morning, not so long ago:

> "Dere Editor:
>
> We uns from Mississippy haint beholdin to none of yore high-falutin city fellers when hit kums to hittin a skwirrel's eye at 100 yards. Best you be keerful cause usent I to be the best shot in these yar mountains. What fur did you uns leave my pitcher outa yore paper. Haint I bin a'doin more fur yore durn old kunvenchin then all tha rest of them 'ere doods put tagither. Guess you'ans kelcalate yore powerful smert but yore jest smert ellicks. So I hereby resine and kwit. And no more mountain dew fur you uns.
>
> Grandpappy."

And that was the letter, so help us! There was only one thing to do—so we did it! We created an "appeasement committee" and told them to spare no expense, no effort to get the old gent back into the fold.

Strategy has won a temporary victory at least—and thanks to artist* Joe Marias we present Grandpappy in all his pristine glory. You can see from his benign expression that he is again happy as all daylight, and you can bet a cookie that the convention will ring the bell. We can't lose with Grandpappy as our mascot.

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*Our favorite "doodler."

MARINERS CLUB of CALIFORNIA

A. T. HUNTER, *President*
ERIK KRAG, *Vice-President*
STANLEY E. ALLEN, *Secretary-Treasurer*

Board of Governors
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WINSLOW D. CONN
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C. M. LE COUNT
EDWARD MACFARLAN
FRED MC LEAN
DAVID MILLAR
THOMAS G. MUNRO
F. P. RITCHIE
THOMAS A. SHORT

The hornpipe luring members of the Mariners Club of California aboard for the 12th Annual Spring Frolic was heeded by over two hundred and fifty men.

The good ship was well down to her Plimsol mark proving once again how popular these get-togethers are rated in the records of maritime events.

Captain A. T. "Tom" Hunter, Chief Pilot of the Mariners, bid his shipmates welcome and the program immediately hit a lively tempo.

The Villa of Venitian Marie was the place. May 23rd, the date.

Informal as a pair of suspenders, mind you . . . but grand fun and a swell bunch of fellows!

These committee men are to be congratulated: Dick Glissman, chairman, Ed Binder, Ed Gunderson, Ed. Macfarlane, Al Mattingly, Al O'Leary, Howard Oxsen and Harold Weule.

* * *

A pleasant affair was the luncheon meeting of The Mariners held on June 4th, at the regular mooring place, 140 Battery Street.

Announced as an Open Forum the members were brought up to date on plans out ahead. Important announcement was the good word that meetings will go right along during the usual vacation months.

Cal MacMillan, Coast Guard vet, regaled us with accounts of personal experiences. "I never tell anecdotes about events which I have not personally witnessed." His story of the "Angels of Mercy" in isolated Alaskan ports is a classic. We've heard it retold several times since with a credit-line to Cal.

Jim Hines took us on a pilgrimage through some of the Southern haunts (all is "relativity" down in Bummin'-ham!) and promptly at 1:30 Skipper Tom rang down the curtain on the enjoyable program.

GETTING IT STRAIGHT

The siren shrieks its farewell note and proudly on her way
The brand new giant liner moves in grandeur down the bay.
A marvelous creation, her builders' joy and pride,
A great hope of her owners as she floats upon the tide.

The passengers in festive mood, mid laughter, jest and quip,
With keen delight enjoying the great ship's maiden trip,
"She is sure to break the record," "She'll do 20 knots or more,"
Is the hope of all aboard her as she leaves her native shore.

Upon the bridge the Captain proud and like all skippers bold,
Bedecked in gorgeous raiment of Navy Blue and Gold.
All eyes are fixed upon him, it is going to his head,
As he stops to drop the pilot, then rings down "Full speed ahead."

And now begins the battle for the trophy of the seas,
By men not clad in blue and gold, but lowly dungarees.
On deck the scene is blithe and gay, fair ladies, song and wine,
But hell is popping down below, beneath the deep load line.

The Chief snaps out his orders to his staff on watch below,
His men obey his mandates as about their task they go.
The pressure must not fluctuate, the bearings can't run hot,
The revolutions must not fail to make that 20 knot.

At dinner on the first night out the skipper loudly boasts,
"We'll surely break the record," as the gallant ship he toasts.
The task of breaking records put no grey hairs on his head,
His contribution ended when he rang "Full speed ahead."

Through weary days and sleepless nights to consummate their dream
The engineers work ceaselessly 'til Ambrose Light's abeam.
The record has been broken, average "twenty-one point four,"
The Captain wears another stripe, he's made a Commodore.

And thus he claims the credit for what better men have done.
He boasts through press and radio of the victory he has won,
Neglecting e'en to mention, as he prates his ballyhoo,
The men of brain and brawn and guts who shoved the great ship through.

The moral of this story indicates conclusively,
That glory rarely goes to those who win the victory.
So keep this simple thought in mind when you read of record trips,
That the *men* behind the *throttles* are the *men* who drive the ships.

—Herbert G. Lambert, 2nd Asst. Eng.
ESSO Charleston in the JSTOA Review.

John R. Eidom, newly elected president of the Bilge Club

J. R. Eidom, newly-elected president of the Bilge Club, announced the Twelfth Annual Bilge Club Barbecue and Tournament to be held June 21 at Palos Verdes Country Club.

"Skipper" Eidom suggests that all prospective participants prepare their load-line ready to receive cargo on June 21st at Palos Verdes Country Club.

The event was launched on the evening of May 12 at the California Yacht Club, where a full crew of officers were selected.

They are:

Honorary general chairman, W. H. Wickersham.

General chairman, President J. R. Eidom.

Assistant Chairman, Captain F. D. Arthur.

Secretary to chairman, L. H. Connor.

Tournament chairman, Jack Malseed.

Tug-of-war chairman, John E. Marshall.

Attendance chairman, Captain Theo. W. Peters.

Barbecue chairman, Hampton Neergaard.

Grounds chairman, Frank Cavanaugh.

Reception chairman, Lloyd J. Moore.

Baseball chairman, J. J. Buntin.

Tennis chairman, Remington A. Mills.

Prize chairman, Harold S. Bowen.

Handicapper, Charles I. Houghton.

Horseshoe chairman, W. S. Rash.

Entertainment chairman, M. A. Richley.

Finance chairman, E. J. McKee.

Rules chairman, James Craig.

"Port of Chico!"

Newest appointee for Xzit Pacific Company . . . Brickseal Refractory Co. . . . Saverite Engineering Co. for Coast district agent is Don L. Buckman at Chico, California.

According to Bill Rudy, who is Pacific Coast Sales Manager for these managers of protective materials, it is expected that Mr. Buckman's activity in the territory where so many old-time marine men are now located will go a long way in making Chico ship conscious.

Don himself has come up through the hawse pipe and has seen plenty of service in marine power plants. However, we have an idea that his Chico work in behalf of the Xzit-Brickseal-Saverite interests will be largely concentrated on the many stationary plants in and around the area north of Sacramento.

Good luck, Don!

American Steel and Wire Changes

A number of important changes in the operating department of the American Steel and Wire Company, subsidiary of the U. S. Steel Corporation, have been announced affecting the company's operations in Waukegan and Joliet, Illinois; Cleveland, Ohio; and Worcester, Massachusetts.

G. H. Bendell, who has been superintendent at Waukegan Works, has been transferred to Joliet as assistant general superintendent of Joliet operations. S. R. Snow, formerly assistant superintendent at Waukegan, has been appointed general superintendent. Mr. Snow's place is taken by J. R. Gaut who is being transferred from the vice president's office in Cleveland.

Van H. Leichliter, formerly superintendent of Wire Mill, Cuyahoga Works, Cleveland, has been appointed superintendent, Wire Mills, South Works, Worcester, to be in charge of the consolidation of Worcester wire mills under the present rehabilitation program. He succeeds **F. P. Leahey,** who has been appointed superintendent, Wire Mill, Cuyahoga Works.

Daniel Lynch has been appointed superintendent of the Rockdale Division, Joliet, and **R. E. Camp,** superintendent of the Scott Street Division. Both men have been assistant superintendents of these divisions.

At the same time, at Waukegan, R. L. Lewis has been appointed superintendent of engineering and maintenance, W. B. McShane, superintendent of the Wire Mills, J. H. Thomas, superintendent of Spring Mills, and Thomas Tyrrell, superintendent of Rod Mills.

V. P. Rumely

New Vice President for Crane Co.

Crane Co., Chicago, announces the election of **V. P. Rumely** as vice president in charge of manufacturing, to succeed **J. H. Collier,** who had previously been made president. Mr. Rumely has been works manager of the Crane Chicago plant for the past four years, during which he has been very closely associated with Mr. Collier.

Born 52 years ago in La Porte County, Indiana, Mr. Rumely studied mechanical engineering at Purdue University, and later at the University of Wisconsin, graduating in 1912. His first job after leaving college was in the farm implement plant of his grandfather, M. Rumely, in La Porte, Indiana (later known as the Advance Rumely Co.). In 1914-15 he was with the Buick Motor Co., and in 1916 went to the Hudson Motor Co. Starting in the Hudson shops, he progressed through every stage of the production management to superintendent and factory manager, the position he held when he resigned to join the Crane organization in 1937.

James Coombe President of Powell

James Coombe recently was elected president of The Wm. Powell Company, manufacturers of bronze, iron, steel, and corrosion resistant valves. With the exception of two and one-half years, during which time he served overseas as captain of the artillery in the First World War, he has been associated with the company since his graduation from Yale in 1910.

Mr. Coombe is a director of the First National Bank, the Crosley Corporation, the Globe-Wernicke Company, and the Randall Corporation.

The Wm. Powell Company announces also the election of Harry H. Coombe, chairman of the board of directors and treasurer; George E. Weitkamp, first vice president and secretary; David M. Forker, Oliver F. Gang, Wm. E. Heilig, and E. R. Noll, vice presidents; and Wm. E. Minor, Jr., assistant to the president.

B. A. Robison

Robison Appointed

J. F. Gehan, vice president of American Export Lines, announced on May 24 the appointment of **B. A. Robison** as acting operating manager of the lines.

Mr. Robison fills the position left vacant by **L. S. Andrews,** who is on leave of absence serving as chief of operations for the U. S. Army Transport Service.

Mr. Robison has been with American Export Lines since 1934, serving first as superintending engineer and later as marine superintendent. A native of Tacoma, Washington, he served an apprenticeship in the machinist trade in Seattle and later sailed from that port. As a lieutenant in the Naval Reserve, he came to the East Coast during the World War and served as an officer aboard various cargo vessels in wartime operations. After the war he sailed for several years with the U. S. Mail and Atlantic Transport lines. Following this he was superintendent of the Consolidated Iron Works at Hoboken, N. J. He served as superintending engineer of the Roosevelt Line and the American France Line before joining American Export in the same capacity.

Somerville Elected

Now rounding out his twenty-fifth year in the design and sale of internal combustion engines, **G. N. Somerville** has been elected vice president of the Atlas Imperial Diesel Engine Company, Oakland, California. He rose from the drawing board to chief engineer, and in his long association with the company has held the posts of export manager and general sales manager, and has served on the board of directors, thus bringing to his new position a background of much experience.

Mr. Somerville's headquarters will continue in the executive offices of the company in Oakland, and he will be busy in general supervision of all activities of the Oakland factory.

* * *

The Nitrose Company, Peoria, Illinois, has appointed the Frank Groves Company, 136 So. Park Street, San Francisco, as its representatives in the Northern California territory.

Nitrose is a corrosion-resisting coating for marine and industrial use, easily applied and requires no expensive sandblasting or scraping before application.

James Coombe

York Ice Machinery Corporation's California sales staff at sales conference at Whitcomb Hotel, San Francisco. Significant fact: Most of them are long time York employees as average time of service with the company for entire group is eighteen and one-half years

York Expands Coast Facilities

J. L. Rosenmiller, sales promotion manager of the York Ice Machinery Corporation, York, Pa., was in San Francisco the early part of May on a tour of the main branches of the company, which included Seattle, Portland, San Francisco, Los Angeles and Houston in the West.

Mr. Rosenmiller was particularly interested in the activity in western shipyards and the tremendous expansion program under way in existing yards and the new yards being built at Seattle, Portland, Richmond and Los Angeles.

"Our company is now manufacturing air conditioning and refrigerating equipment and cold storage doors for over three hundred boats on the Pacific, Atlantic and Southern cosast," he said.

"We are expanding our forces on the West Coast to adequately handle the installation of equipment and give the service required by the shipbuilding industry.

"Our plants in York are operating on several shifts and we now have more employees than at any time since the company was started in 1885."

Mr. Rosenmiller's trip included an all-day conference at the Whitcomb Hotel in San Francisco on May 3 attended by the company's California sales staff on sales, policies and engineering matters pertaining principally to the accessory equipment and supplies division.

Present at the meeting were West Coast Regional Manager R. H. Beck of the Los Angeles office with his sales staff and Manager Joe Austin of the San Francisco branch and his staff.

Managers of the Northwest branches of the company are Sam Cordis at Seattle and Frank Stephens at Portland.

Carl Anderson of the Western Freight Association announced that **Alan Ferl,** formerly on the freight staff of the Panama Pacific Line, had become associated with his firm during May.

Herbert S. Lear, formerly treasurer of the American Trading Company of San Francisco, has become special U. S. representative of Sir Walter Carpenter, head of the W. K. Carpenter Oversea Shipping & Island Products, Ltd., and the Edna Trading Co. of Panama.

Mr. Lear is located at 310 Sansome Street, San Francisco.

R. E. Gillmor, president and general manager of the Sperry Gyroscope Company, Inc., presenting the 10,000th certificate of graduation from the Sperry Gyro-Compass School to Second Officer Robert R. Rogers of Standard Oil Company of New Jersey's tanker T. J. Bedford, Jr., on April 4, 1941. The Sperry Gyro-Compass School was founded in 1914 by O. B. Whitaker, now manager of the Marine Sales Department. The first certificate was issued on November 29, 1923. Left to right: Mr. Gillmor, Robert B. Lea, vice president and sales manager, John J. Brierly, instructor Navigational School, and Second Officer Rogers

McCormick Steamship Activities

By Julius Kruttschnitt, Jr.

Passenger Traffic Manager, McCormick Steamship Company

"Vagabond Voyages," a type of leisurely cruise on combination passenger and cargo vessels, is steadily sweeping into popularity on the Pacific Coast. As these ships are primarily freight carriers, the passenger list is necessarily limited and a close-knit friendly atmosphere prevails on the ship from the moment she leaves port. Large is the number of individuals who are glad to get off the beaten path every once in a while.

We have long waiting lists on both our short cruises to the Northwest as well as our New York service via Puerto Rico in the West Indies. It is well to note that the apparent withdrawal of the Panama Pacific Line from the Intercoastal trade leaves only the Luckenbach and McCormick Lines operating in that route. For the time being, these two lines do not contemplate any increase in fares.

Insofar as our westbound service is concerned, we are running only sixty to seventy per cent capacity. Apparently, the easterners are a little bit timid to travel by water and what we have done is to work out a special arrangement with the Air Transport Association of America (comprised of all the major air lines) whereby passengers flying from the Pacific Coast to the Atlantic Seaboard receive a reduced fare by air and likewise a concession on our own fares. In this manner we have developed the Pacific Coast as a source for our westbound passengers, westerners being more brave than the easterners. Now, speaking seriously, the ocean-air circle trip between the McCormick Steamship Lines and the major domestic air lines has proven quite popular and we might add that the word "reduction" to our way of thinking is the most important word that can be used in passenger advertising.

We have also recently worked out a plan whereby persons with limited amount of time may use Pan American Airways to the Canal Zone and return on our line at reduced fares. Thus passengers can enjoy the thrill of an air trip and the rest of a sea voyage; this trip can be made in 16 days.

Along with several other transportation men including Fred S. Howard, Asst. Vice President, Passenger Traffic, of Southern Pacific, and Edward G. White, Passenger Traffic Manager of the N.Y.K. Line (because of the South American service which the N.Y.K. Lines operates) I have been invited to represent the Pacific Coast at the second inter-American Travel Congress to be held in Mexico City September 15 to 24 this year. This Congress is being held under the auspices of the Pan American Union and invitations have been extended to all Latin American Countries, Dominion of Canada, Alaska, Territory of Hawaii, and Puerto Rico. Attendance is also being asked of the Department of State, Department of Interior, and the United States Maritime Commission. Representatives of Maritime, Air, Railroad, Highway, Hotel and Travel Services will also participate in this Travel Convention.

It must not be overlooked that this coming meet will help to a large extent in making our relations with the Latin American Countries more solid and we all know that a development of a goodly amount of tourist travel between two countries can well be considered a preamble to commercial trade on a large scale. In view of the situation in other parts of the world and the possibility that an attempt may develop to destroy the present close harmony existing in all the Americas, it is highly essential that countries of the Western Hemisphere get together as closely as possible, both culturally and in business.

We have been asked about the Travel Credit Plan which is being used by some of the transportation companies; in our opinion this arrangement will not prove to be any great or important stimulant for travel business. For example, persons who purchase an ice box on the installment plan have something tangible while they are making the monthly payments, but persons remitting from month to month after returning from a trip have only the pleasant memories on hand. After all, we want our passengers to go to sea with peace of mind and not have to think about the burden of their payments upon their return. Incidentally, in most cases the interest rate on the debit balance is 8 per cent which we believe constitutes a pretty high premium to have to pay on transportation purchased by means of credit.

* * *

The Maritime Commission announced early in May that **Henry L. Deimal, Jr.,** had been appointed director of their new department, Division of Economics and Statistics.

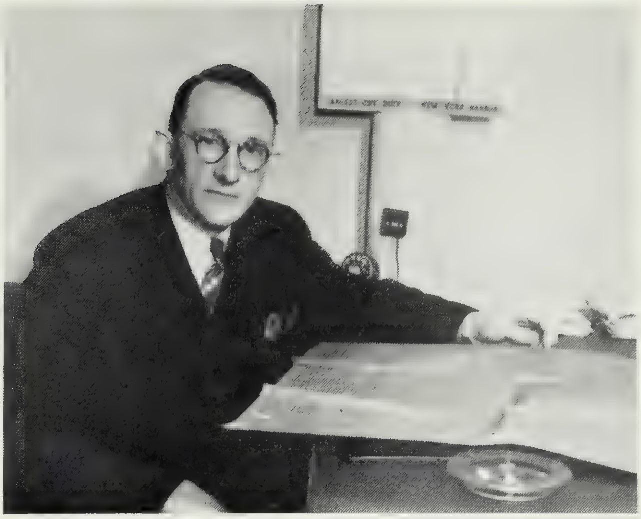
The Commission's Division of Research and its personnel has been absorbed by the new department.

Mr. Deimel, formerly of California, was previously assistant chief of the Division of Commercial Treaties and Agreements at the State Department. He will be assisted by Lehman P. Nickell, formerly chief of the section of special studies of the Division of Research.

* * *

San Francisco shippers and export men who use the Spanish language in execution of their business have formed a group who will meet weekly at a luncheon in an effort to improve their knowledge of the language. The meetings started on May 8, according to **Mac Cremer** of the Merchants Exchange. He further stated that there would be no officers, dues or speeches and that anyone interested in attending could contact him.

Michael J. Brennan



Henry F. Gelhaus

Todd Appointments

John D. Reilly, president of Todd Shipyards Corporation, announces the appointment of Henry F. Gelhaus and Captain Michael J. Brennan to managerial positions at Robins Dry Dock & Repair Company, Brooklyn subsidiary of Todd Shipyards Corporation. Mr. Gelhaus, noted Pacific Coast machinery and engineering expert, becomes operating superintendent; and Captain Brennan, perhaps best remembered as captain of Commander Richard E. Byrd's north polar vessel Chantier of the Josephine Ford expedition of 1926, is appointed superintendent in charge of plant and equipment.

Mr. Reilly also announced the election of **William A. Maloney,** vice president in charge of sales of Todd Shipyards Corporation, to a directorship on the board of the Robins Dry Dock & Repair Company.

Born in Marysville, Calif., September 1, 1886, Mr. Gelhaus' career dates back to 1901 as an apprentice at the then Union Iron Works of San Francisco, at which many notable merchant and naval craft were constructed. In 1905 he went to the Pacific Mail S. S. Co., as assistant engineer, the Siberia and Manchuria being among many vessels on which he served. From 1912 to 1941 he was with Swayne & Hoyt of San Francisco holding various positions such as superintending engineer, chief engineer, marine superintendent, manager of engineering and construction work.

He was lent for three years during the last war to the Craig Steamship Building Co. of San Francisco, as superintendent of machinery and had charge of many installations at the company's Long Beach, Calif., plant.

Until he retired this year Mr. Gelhaus was active in the United States Naval Reserve in which corps he held the rank of Lieut. Commander. He is a noted diesel and steam turbine expert, and is a member of the American Society of Engineers, the American Society of Naval Architects, and the American Society of Naval Engineers.

* * *

After 35 years of active participation in the firm of Mattoon & Company, custom house brokers of San Francisco, **B. C. Bremer,** senior partner of the firm, has retired as of June 1.

Mr. Bremer will continue to serve as Consul for Haiti with headquarters at 24 California Street, San Francisco.

F. B. Howland and E. G. Chavez are now partners in the firm of Mattoon & Company.

Roger Bunce became marine superintendent of the Globe Wireless Co. in San Francisco in May. Just prior to his appointment, he had been commercial agent for the company in Los Angeles.

U. S. Steel Personnel

George K. Leet, secretary of the United States Steel Corporation, and for many years a prominent figure in the steel industry, retired on May 6 after thirty years of service with the corporation. Mr. Leet has held the office of secretary for more than nineteen years. He retired under the Corporation's Pension Plan following the annual organization meeting of the board of directors.

William Averell Brown, assistant general solicitor of the United States Steel Corporation since 1918, was elected secretary to succeed Mr. Leet.

Switch gear engineer G. H. Welch of Westinghouse says goodbye to Ed Martin at San Francisco Airport. Welch is designing switchboards for Mare Island ships

San Francisco Dedicates New Marine Museum

The first Marine Museum in the West was officially opened May 6 in San Francisco's Aquatic Park Center.

Approximately 100 valuable ship models, prints, photographs and documents are included in the exhibition, contributed by private collections as well as shipping companies. Included among the miniature vessels are clipper ships, schooner yachts, pilot schooners, cargo steamers, passenger ships, derrick barges, naval battleships, and even a Chinese junk.

One of the most striking of the model ships is that of the Queen Mary. It is over 12 feet long, in perfect scale and is complete to the smallest deck fitting. Two of the models are of large sailing vessels under full sail. One is a model of the famous Cape Horn clipper, the Tillie E. Starbuck. Another is a model of the four-masted bark, Kenilworth, with figures of her crew working on the deck. The well-known American clipper ship, Flying Cloud, is represented by an outstanding model, showing the ship just dropping anchor with the crew furling sail, launching a boat and doing other work.

Beginning with the embryo of the Marine Exhibit at the 1940 Exposition, which was moved to the Merchants' Exchange Building last October, the new Museum already has anticipated its future development into a Museum of Science and Industry by its recent incorporation under that name.

The Aquatic Park Center was offered the new Museum recently by the City Park Commission, which has provided the blue room at the Center for that purpose. During the six months the exhibit was housed at the Merchants' Exchange Building it attracted more than 20,000 persons.

Among those who have sponsored the Museum and made it possible are Mrs. Alma Spreckels Awl, Felix McGinnis, Mrs. Frank Rice Short, William P. Roth, Mrs. Dorothy Dupuy, John R. Rosekrans, Roger Lapham and Campbell McGregor.

Walter J. Walsh, president of the Navy League, president of the Army and Navy Club and past president of the Mariners' Club, is president of the Board of Trustees of the new Museum.

W. E. Bond is managing director of the Museum and will be in charge of its office which will be maintained in the Merchants' Exchange Building, San Francisco. Captain Charles Reiner, a retired sea captain and hero of many thrilling adventures, is in charge of the exhibition and acts as official guide.

* * *

Moore-McCormack

Captain Axel Pearson, who has been serving as chief officer on the Moore-McCormack cargo liner Mormactern, has been made commander of the cargo liner Independence Hall, operating in the company's Pacific Republics Line service between the Pacific Coast of the United States and the east coast of South America, it was announced recently by Albert V. Moore, president of Moore-McCormack Lines. Captain Samuel E. Johnson, who has commanded the Independence Hall, has resigned to become a pilot in the Panama Canal.

* * *

William C. Neven, assistant passenger traffic manager of Moore-McCormack Lines, left the company recently to assume new duties as purchasing officer in the incoming stores group of the supply department at the Brooklyn Navy Yard. Mr. Neven, who has the rank of lieutenant in the Naval Reserve, is one of the best known men in New York shipping and has spent the last twenty years in that industry.

On May 5, J. Walter Doyle, United States collector of customs at Honolulu, T. H., died from a heart attack at his home in Honolulu.

Born in Yokohama in 1879, Mr. Doyle spent a colorful life divided between the shipping industry and the newspaper field in Honolulu. In 1933, he was appointed to the post of collector of customs by President Roosevelt.

Traffic Award

T. F. McCue, traffic manager of Crane Company of Los Angeles, is the first man on the Pacific Coast to receive the "certificate of meritorious award," one of three issued by the Associated Traffic Clubs of America at each of their annual conventions. He was selected because of his outstanding work as chairman of the educational committee of the Los Angeles Transportation Club.

Miss Clare Link, president of the Women's Traffic Club of Los Angeles and delegate to the national convention of the Associated Traffic Clubs, brought back the award from Jacksonville, Florida, where the convention was held. It was presented to Mr. McCue by Miss Emma Kentz, an employee of the Union Pacific and a member of the board of directors of the Traffic Club, at the Transportation Clubs' Monday luncheon, May 19.

* * *

United States Maritime Commission
Washington

April 29, 1941

Dear Sirs:

Please accept my thanks for your kindness in forwarding to me a copy of your article concerning the 200 ships being built under our Emergency Program which appeared in the April issue of your magazine.

The services which you are rendering the marine community with your excellent articles will be appreciated by all.

Very truly yours,

J. E. Schmeltzer
Director, Emergency Ship Construction Division.

* * *

Admiral Speaks

Rear Admiral John Wills Greenslade, newly appointed Commandant of the Twelfth Naval District, spoke on the subject "The Navy as Guardian of Our Trade Lanes" at the National Foreign Trade Week Luncheon on Tuesday noon, May 20, 1941, at the Leamington Bowl, Hotel Leamington in Oakland.

When
QUICK ACTION
is
VITAL!

Buffalo
"SUPER"

Approved FIRE EXTINGUISHERS

Here's dependable protection that is built inside and out to stand the gaff of marine conditions—and be ready for quick, effective action the instant fire breaks out. The **Buffalo** "SUPER" VL Fire Extinguisher (1 qt. size) is a handy, foolproof fire fighter. A few quick strokes of the pump, and the fire is smothered by a gas forming liquid Effective on all kinds of blazes, including gasoline and oil. Approved by U. S. Bureau of Marine Inspection and Navigation.

Sold by

Oregon Marine Supply Co. Portland and Astoria, Ore.	**Western Fire Equipment Co.** San Francisco	**Pacific Marine Supply Co.** Seattle, Wash.

BUFFALO FIRE APPLIANCE CORP.
44 Central Avenue, Buffalo, N. Y.

BUFFALO *Better Built* FIRE EXTINGUISHERS

The
KELVIN-WHITE
SPHERICAL COMPASS

has been installed on many new passenger and freight ships for the Maritime Commission and private owners.

* * *

We manufacture all kinds of compasses and binnacles, and are contractors for any and all kinds of Navigational Equipment.

●

KELVIN-WHITE CO.
FACTORY IN BOSTON
Represented on the Pacific Coast by
Capt. Frank Jansen, 1361 South Flower Street, Los Angeles
George E. Butler Co., 356 California Street, San Francisco
Nuttall-Styris Co., 825 Columbia St., San Diego, Calif.
Max Kuner Company, 812 First Avenue, Seattle
Pacific Marine Supply Company, Seattle

UNDERSTANDING

It is a deeply satisfying experience to work with men so understanding of your problems, so skilled in interpreting your every requirement, that demand and fulfillment mesh together. Deeply satisfying, too, is the assurance of smooth progression from earliest design to the ultimate installation.

Architects, builders and owners who call upon Hyde to supply their deck machinery, expect and find that understanding. Behind Hyde lies nearly a century of specialized experience, an unequalled reputation for sound design, skilled craftsmanship and absolute integrity.

HYDE WINDLASS COMPANY, BATH, MAINE

West Coast Representative:
Thomas A. Short, 575 Howard Street, San Francisco

IT IS HYDE'S PRIVILEGE TO SUPPLY DECK MACHINERY FOR:

Bethlehem Steel Co. (Shipbuilding Division) Fore River Plant	Newport News Shipbuilding and Dry Dock Co.	Federal Shipbuilding and Dry Dock Co.
U.S.S. SAN DIEGO U.S.S. SAN JUAN	U.S.S. INDIANA U.S.S. HORNET	U.S.S. ATLANTA U.S.S. JUNEAU

HYDE
DECK MACHINERY

At the Launching of S. S. Van Buren

Henry F. Grady, president, American President Lines; Mrs. Max O'Rell Truitt, wife Maritime Commissioner; Mrs. Alben W. Barkley (sponsor); Miss Gladys Carter (maid of honor), daughter Representative Carter of California

Traffic Outing

Plans were recently completed for the 14th Annual Picnic of the Pacific Traffic Association to be held in the Linda Vista Park, Mission San Jose, on Sunday, May 25.

Under the able chairmanship of Captain Cyril L. Meek, traffic manager, Bay Cities Transportation Co., the picnic committee has put in many hours of work completing details for the gala occasion.

Over 100 local firms have donated prizes to be awarded to the lucky holders of winning gate tickets. Keen interest is being displayed in the annual baseball game between the Pacific Traffic Association, baseball team captained by J. W. Ostle, Southern Pacific Co., and the Oakland Traffic Club's nine, captained by L. H. Wolters, Golden State Co., Ltd. A handsome perpetual trophy will be awarded to the winning team. Dancing will be provided to the rhythmic tunes of Joaquin Garay and his La Fiesta Club orchestra.

As is the annual custom, the members of the Pacific Traffic Association will play host to the unfortunate youngsters of the Gough Street Oral & Deaf School at the picnic.

The following committee are assisting Chairman Meek in carrying out the details of the picnic: Prizes, H. A. Kerns, Bekins Van & Storage Company; Tickets, A. M. Davis, Independent Freight Lines; Dancing, Arnold Thiess, Acme Atlas Fast Freight; Baseball, J. W. Ostle, Southern Pacific Company; Men's Games, Herbert Walmsley, General Steamship Corp.; Children's Games, P. L. Wilson, National Cash Register Company; Swimming, Dwight Yeaman, Haslett Warehouse Company; Photographs, John J. Edwards, Pacific Intermountain Express Company; Transportation, John Hanavan, Furness Line.

◆

Morris Machine Works, Baldwinsville, New York, manufacturers of centrifugal pumps, hydraulic dredges and steam engines, announces the appointment of L. J. Lynch as their new representative in the Detroit District. Mr. Lynch is located at 403 Kales Building, Detroit, and his telephone number is Randolf 6021.

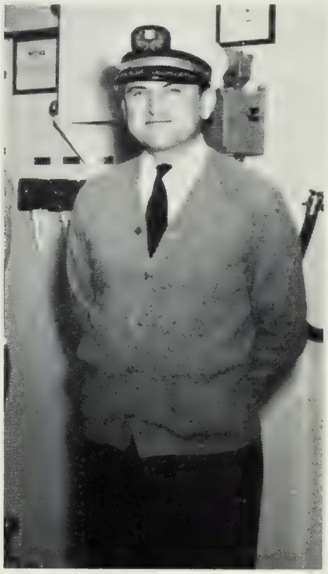
Mormacsun Skipper

Charles Gregovich went to sea as a boy. He enlisted in the Navy for World War I in April, 1917, when he was fourteen years and nine months old—he does not disclose how he fooled the enlisting officer over his age.

He remained for "the duration" and was discharged as a coxswain.

Gregovich went to the United States Shipping Board in 1919, and in 1928 got his second mate's ticket. He was in tanker service Atlantic coastwise and between the Pacific and Atlantic coasts.

In 1929 he joined Mormac services as third officer and after service on the S. S. Commercial Navigator, got his master's papers in 1932.



After serving as chief officer on the S. S. Commercial Alabaman, 1934 saw him receive command of the same ship. Gregovich was both chief officer and master of the S. S. Commercial Quaker in 1935. From 1936 to 1938 he was master of the S. S. Commercial Bostonian.

All of these vessels were in the Gulf Atlantic coastwise trade, known as the Mormac-Gulf Lines.

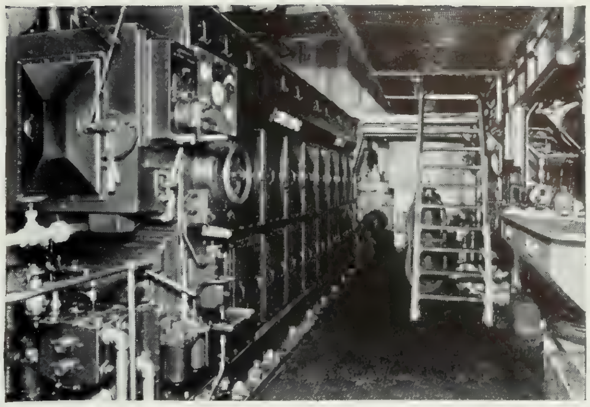
After inaugurating the Pacific Coast service of his company and making four trips on the S. S. City of Flint, Captain Gregovich was appointed, on April 21, 1941, to command the newest of the Pacific Republics Line C-3 fleet, the S. S. Mormacsun.

Superior DIESEL POWERED

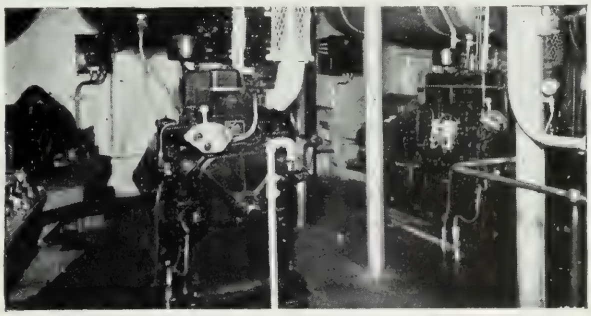
"H. F. DeBardeleben"—Owners: DeBardeleben Coal Corporation, Mobile, Alabama

SUPERIOR main and auxiliary Diesels are rapidly becoming a standard specification in prominent tugboat fleets where only rugged engines can satisfy.

The "H. F." and her sister ship the "H. T." are fine examples of modern towboat design and construction in which economy, efficiency and dependability are skillfully combined to make a truly SUPERIOR tugboat.



Main Engine—One 560 H. P. Four-cycle SUPERIOR Diesel



Auxiliaries—Two 25 k.w. SUPERIOR Diesel Generator Sets

THE NATIONAL SUPPLY COMPANY... SUPERIOR ENGINE DIVISION

SALES OFFICES: Springfield, Ohio; Philadelphia, Penna.; New York, N. Y.; Los Angeles, Cal.; Jacksonville, Fla.; Houston, Texas; St. Louis, Mo.; Fort Worth, Texas; Tulsa, Okla.; Boston, Mass. FACTORIES: Springfield, Ohio; Philadelphia, Penna.

COEN

MULTIFILM OIL HEATERS

Are of all steel construction, light weight, small in size, cleanable and many installations have proved them to be most satisfactory. They are approved for marine service and at the present time early shipments can be made.

COEN COMPANY • INCORPORATED

Combustion Engineers

SAN FRANCISCO NEW YORK

Necrology

The many Pacific Coast friends of Daulton Mann, executive vice president and director of Grace Line, were shocked to learn of his death on Thursday, May 15, at Phillip's House, Boston, after an illness of several months.

Mr. Mann was born in Oakland, California, April 15, 1893, the son of Seth Mann and Maud Daulton Mann. He was educated in San Francisco and at the age of 18 joined the California Atlantic Steamship Company operating from the Pacific Coast of the United States to Panama, where he was stationed for a year or two during the construction of the Canal.

Returning to San Francisco in 1913 he joined the steamship department of the San Francisco house of W. R. Grace & Company and in 1915 when the Pacific Mail lines came under the control of W. R. Grace & Co. and American International Corporation, Mr. Mann became assistant general manager.

When the Pacific Mail retired from the transpacific service in 1924, Mr. Mann became vice president and general manager of the Panama Mail Steamship Company, owned by W. R. Grace & Company, which took over the old Pacific Mail service from San Francisco to Central America, Panama Canal, Colombia, Cuba and New York.

He moved to New York in 1929 and became executive vice president of the Grace Line which, shortly thereafter, laid down the four new de luxe passenger liners, Santa Rosa, Santa Elena, Santa Paula and Santa Lucia which established a new standard of passenger service in the Latin American trade.

Mr. Mann was the first steamship executive to modernize his advertising by the use of color photography which vividly portrayed the colorful attractions of the Latin American countries and of the ships themselves. He had a very high reputation as a traffic expert and an operating official, and was in great demand at the annual meetings of various steamship conferences.

Daulton Mann

When the Grace Line service from New York via Latin American ports to California was forced by changes in the American shipping law to withdraw from the intercoastal service in 1937, Mr. Mann established the present Grace Line Caribbean service which now operates from New York to Bermuda, Curacao, Venezuela and Colombia.

He was married in 1914 to Miss Ethel Gregg, daughter of the late Mr. and Mrs. Wellington Gregg of San Francisco. He is survived by his wife; by a son Daulton Mann, Jr., a freshman at Yale, and by a sister, Mrs. Innis Randolph of Wilton, Connecticut.

Mr. Mann's clubs were India House, Racquet and Tennis and Deepdale Golf Club in New York and the Pacific Union and San Francisco Golf Club in San Francisco.

He was a director of the American Merchant Marine Institute, American Bureau of Shipping, American Steamship Owners' Protective and Indemnity Association, and Grace Line.

CARROLL S. SMITH

"Through with engines" and, upon receipt of that signal from the "High Bridge," Carroll S. Smith, consulting marine engineer, completed his last voyage in the early morning of May 8, 1941.

His colorful career began 75 years ago, when he was born in Chester, Pa., of Quaker parents.

He was born in a marine atmosphere, his father and uncle being engaged in water transportation between Chester and Philadelphia, Pennsylvania; and Wilmington, Delaware.

As a young man, he served in the John Roach Ship Yards.

His Marine Engineer's Certificate was issued in 1884. Early refrigeration experience led him eventually to the presidency of the De la Vergne Machine Co., builders of ammonia refrigerating machinery and, later, four-cycle diesel engines.

In the interim, he became engineering consultant to important steamship lines. These included the Eastern Steamship Lines, Panama Railroad S. S. Co., United States Lines, Peninsular and Occidental Line, Florida & East Coast Car Ferry Co. and others. In the Florida & East Coast Car Ferry Co. he was particularly interested.

In addition to his consulting activities, he was a director of the Wm. Cramp & Sons Ship & Engine Building Co. and the American Engineering Co., and their New York agent. He formed the Cuban Carbonic Co. and was a member of the Society of Naval Architects.

To those who knew him well, his kindly and sound advice, encouraging words and sympathetic understanding will live as long as memory is green. To those whose privilege it was to know this beloved character, the world is a sadder place with his passing.

Contemporaries and his special friends included the late Mr. Wm. J. Todd, Mr. Harry J. Mull, Mr. Calvin Austin, president of Eastern S. S. Co., Mr. Morse, Mr. Flagler of the Florida East Coast R. R., and others.

* * *

With deep regret, we report the death of Glenn Harrison Barnard on May 6. Mr. Barnard was the very competent and popular general manager of the Electro Dynamic Works of the Electric Boat Company, Bayonne, New Jersey.

New Lubricant For High Speed Diesels

For several years the change in design in diesel engines has added materially to the headaches of marine engineers. As long as the diesels operated at speeds of 200 to 300 rpm and had the higher maximum pressures about the same as compression pressures, certainly not over 500 pounds per square inch, and as long as the engineer used a high grade oil, lubrication griefs were few and far between.

However, as the modern high speed diesels have developed, oil troubles have been frequent. These diesels with speeds of 1800 to 2000 rpm and with maximum pressures up to 700 to 900 pounds per square inch, have definitely put more burdens on the conventional oil, even the conventional Pennsylvania oil, than it could stand.

As every engineer knows, all of the latest developments and engine design construction have tended toward less weight, less space, and more power per cubic inch. As these desirable qualities have been realized, the job thrown on the lubricant has grown tougher and tougher. The day when an oil was placed in an engine only to lubricate it has long since passed. Today's lubricants must lubricate all moving parts at all temperatures, act as a cooling agent, a sealing agent and definitely a cleaning agent.

With all of these problems very much in mind the refiners of the original Pennsylvania Oil, Valvoline Oil Company of Cincinnati, have developed the new Valvoline "HPO" (High Power Output), which they announce as the "first successful Pennsylvania lubricant for modern high speed diesels and gasoline engines operating under peak loads." The new product is a high viscosity index lubricant, engineered especially to minimize costly repairs caused by oil oxidation and to overcome the other lubrication failures which have been common in heavy duty operation.

"We tackled the problem from the operator's side of the ledger," said L. A. Calkins, Chief Engineer of Valvoline, and developer of "HPO," "and used data obtained from the Valvoline Engineering Service and from our own laboratory tests in developing the new oil."

It was found from these various sources that the chief causes of engine failure in peak load operation resulted from oil oxidation, the products of which are various acid and oxygen compounds, many resinous in nature, and having a tendency to form sticky, gummy deposits in the engine, commonly known as "varnish" and sludge. This "varnish" deposits on piston skirts, under the piston heads, on the valves, in the ring grooves, in the valve alleys and throughout the engine, naturally causing lowered efficiency and sometimes actual stoppage.

To effectively lubricate, seal, cool and clean modern high speed engines, especially those run at full throttle, Valvoline couples two factors in its new "HPO." The first is a high viscosity index (105-110), claimed to be the highest of any heavy duty oil on the market. The second is an effective detergent action.

Heretofore, it has been necessary to choose between a high viscosity index oil and a clean motor. Valvoline "HPO" bridges the gap between the two by retaining the high viscosity index and also supplying a detergent action which carries off the trouble causing oxidation products common in heavy duty operation.

This detergent action results in a "dirtier" oil, but further tests show that this so called "dirt," even though circulating with the oil in its journey through the motor, does not cut down its lubricating qualities. As this foreign matter is at all times kept in suspension, it is easily drained off and out of the motor.

"HPO" has all of the inherent, stable and protective characteristics of high grade Pennsylvania oil, and is proving its mettle in service in some of the toughest diesel operations.

Improved Arc Welders Available

General Electric 35- and 75-ampere atomic-hydrogen arc welders of improved design at reduced cost have recently been made available. Atomic-hydrogen welders are finding increasing use in industry for repairing tools and dies; for filling in flaws or blowholes in steel and bronze castings; and for the fabrication and repair of hard-to-weld metals.

Modern in design, the new welders are compact and self-contained to reduce space requirements and for increased portability and pleasing appearance.

Instead of the transformer and reactor used in previous units, the new welder has a specially designed reactive transformer which combines the functions of both, thus reducing the weight of the welder and improving its electrical characteristics.

Built-in power-factor correction, a feature of the new welders, helps to reduce installation cost and avoid power-factor penalties. Fan-forced ventilation provides cool operation, even at high currents or on high duty cycles.

* * *

Extinguisher "Tamper-Telltale"

The national need for uninterrupted production demands that fire extinguishers be kept ready for emergency use. They must not be tampered with. After use, they must not be returned empty to their brackets. They should be inspected often.

To facilitate frequent inspection and to tell at a glance whether pump type extinguishers have been tampered with or used, Pyrene Gardeseals are now introduced by the Pyrene Manufacturing Company, Newark, N. J. These Gardeseals are bright red, trademarked, visual signals or handle seals that are destroyed the moment an extinguisher is taken from its bracket. Gardeseals, easily applied by soaking in water and placing over handle and bracket, shrink to a tight seal in an hour. They are packed 25 seals to a carton.

PROGRESS IN *Aemrican Shipyards*

Pacific Coast

ASSOCIATED SHIPBUILDERS
Seattle, Wash.

New Construction:

One insulated self-propelled lighter for delivery to U. S. Navy at Puget Sound Navy Yard.

Four small seaplane tenders for delivery to Puget Sound Navy Yard.

ASTORIA MARINE CONSTRUCTION CO.
Astoria, Ore.

New Construction:

Hull No. 1100, wood hull troller. 41' x 11' x 4'6"; Chrysler Crown engine. **Delivery date May 1, 1941.**

Hull No. 1090, wood hull trawler for stock. 56' x 15'6" x 7'6"; 135-hp Superior diesel engine.

Hull No. 1111, wood hull trawler. 60' x 12' x 6'; 100-hp Caterpillar diesel engine. **Delivery date May 1, 1941.**

Four 135' wooden diesel-powered mine sweepers for U. S. Navy. Delivery in 14 months.

BASALT ROCK CO., INC.
Shipbuilding Yard
Napa, Calif.

New Construction:

Twelve steel seagoing 1000-ton cargo barges; contractors, Pacific Navy Air Bases. Delivery at San Francisco Bay. 150' x 40' x 12'. Contract awarded November 15, 1940. **Delivery dates, first two about April 15; thereafter one every 7 or 10 days.**

Two 10,000-bbl. fuel oil tankers for delivery to Mare Island Navy Yard. 235' x 37' x 19'; cost $1,800,000. Contract awarded by Navy Dept., Bureau of S. & A., Washington, D. C. **Keel laying date, June 20, 1941.**

FELLOWS & STEWART, INC.
Wilmington, California

One 100' V-bottomed kelp harvester.
One 45' taxi boat.

BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Division
San Francisco Yard
San Francisco, Calif.

New Construction:

Hulls Nos. 5362-5364, three C-1 cargo vessels for U. S. Maritime Commission. 395' x 60' x 37'6"; 6400 gross tons each; 4000-hp. Full scantling steam propulsion type. Keel laid, No. 5364, January 15, 1941. **Launching dates,** No. 5362, January 10, 1941; No. 5363, March 12, 1941; **No. 5364, June 4, 1941.**

Twenty-five 2100-ton destroyers for U. S. Navy.

Hulls Nos. 5366-5367, two 1650-ton destroyers for U. S. Navy. Keels laid January 13, 1941.

Four 6000-ton cruisers for U. S. Navy.

BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Division
San Pedro, Calif.

New Construction:

Ten 2100-ton destroyers for U. S. Navy.

COMMERCIAL IRON WORKS
Portland, Ore.

New Construction:

Four anti-submarine net tenders.
Seven steel mine sweepers for U. S. Navy.

CONSOLIDATED STEEL CORP., LTD.
Los Angeles, Calif.

New Construction:

Hulls Nos. 156-159, four C-1-BT, full scantling, turbine propulsion cargo vessels for U. S. Maritime Commission. Keel laying date, No. 159, April 1, 1941. **Launching dates,** No. 157, March 27, 1941; **No. 158, June 26, 1941;** No. 159, September 10, 1941. **Delivery dates, No. 156, June 12, 1941;** No. 157, July 26, 1941; No. 158, October 23, 1941; No. 159, December 23, 1941.

Hulls Nos. 181-182, two Design P1-S2-L2 twin screw turbine propulsion transports for U. S. Maritime Commission. Launching dates January 5 and June 8, 1942. Delivery dates September 26 and November 5, 1942.

Hulls Nos. 162-193; 206-221, 48 steel lighters. Keel laying dates, No. 206, July 1, 1941; No. 207, September 15, 1941. Launching dates, No. 206, February 9, 1942; No. 207, June 8, 1942. Delivery dates, No. 206, Nov. 8, 1942; No. 207, December 18, 1942.

Four C-1 cargo vessels.

GENERAL ENGINEERING & DRY DOCK CO.
Alameda, Calif.

New Construction:

Four anti-submarine net tenders for U. S. Navy.

Eight mine sweepers for U. S. Navy.

HARBOR BOAT BUILDING CO.
Terminal Island, Calif.

Fifteen 60-foot U. S. Navy boats. First boat launched March 8, 1941.

Four 136' motor mine sweepers for U. S. Navy.

LAKE WASHINGTON SHIPYARDS
Houghton, Wash.

New Construction:

Four anti-submarine net tenders.
Four thousand A. S. N. T. floats.
Coast and Geodetic Survey ship.
Six seaplane tenders for U. S. Navy.

LOS ANGELES SHIPBUILDING & DRY DOCK CORP.
Los Angeles, Calif.

New Construction:

Hulls Nos. AR6-AR8, three repair vessels for U. S. Navy.

MOORE DRY DOCK CO.
Oakland, Calif.

New Construction:

Hull No. 198, Mormacsun; one C-3 vessel for U. S. Maritime Commission. LOA 492'0", LBP 465'; breadth molded 69'6"; depth molded 42'6". **Delivery date May 1, 1941.**

Hulls Nos. 199-200, two caisson gates for Bureau of Yards and Docks; one for D. D. No. 2, Pearl Harbor, T. H.; one for D. D. No. 5, Puget Sound, Wash. 150' x 22' x 57'; 1800 tons weight. Launching date, No. 200, March 18, 1941. **Delivery dates May 15 and June 1, 1941.**

Hulls Nos. 201-203, three cargo and passenger vessels for U. S. Maritime Commission and Alcoa Steamship Co. 442' x 62' x 25'; depth molded to bridge deck 41'6"; 8500 hp; 17 knots speed; passenger carrying capacity 38. **Keel laying dates,** March 26, **June 16** and September 10, 1941. Estimated delivery dates January 1, March 15 and June 1, 1942.

Hulls Nos. 204-206, three defense vessels for U. S. Navy and Dravo Corp. 110' x 34' x 11'3" molded depth; two diesel-driven generators.

Two submarine tenders for U. S. Navy.

Five submarine rescue vessels for U. S. Navy.

Six C-2 cargo vessels.
Twelve C-2 cargo vessels.

Conversion:

Hull No. 195, U. S. S. Tangier, to seaplane tender for U. S. Navy.

OLSON & WINGE MARINE WORKS

Seattle, Wash.

New Construction:

One 57-foot combination salmon seine diesel boat for Henry Bowman, Wrangell, Alaska. Cost, with equipment, $24,000. **Completion date, May 15, 1941.**

PACIFIC BRIDGE CO.

San Francisco, Calif.

New Construction:

One seagoing drydock for U. S. Navy. Cost $1,649,000.

PACIFIC DRY DOCK & REPAIR CO.

Oakland, Calif.

New Construction:

One all-welded steel oil barge. 148′ x 38′ x 9′; 300,000 gal. capacity.

Lighters. Cost $284,572.

SEATTLE-TACOMA SHIPBUILDING CORP.

Tacoma, Wash.

PLANT No. 1

New Construction:

Hulls No. 2; No. 3, Cape Cleare; No. 4, Cape Fairweather; No. 5, Cape Douglas; five C-1 cargo vessels for U. S. Maritime Commission. Single screw, full scantling diesel propulsion type. Two General M. A. N. 2100-hp engines; 14 knots speed. **Launching dates,** No. 4, April 11, 1941; **No. 5, May 20, 1941. Delivery dates, No. 2, May 28, 1941;** No. 3, August 8, 1941; No. 4, July 1, 1941; No. 5, September, 1941.

Hulls Nos. 6-7, two C-3 shelter deck type cargo steamers for U. S. Maritime Commission. To be converted on completion to U. S. Army troopships. **Keel laying dates,** April 21 and **June 3, 1941.** Launching dates, August 15 and October 1, 1941.

Hulls Nos. 8-11, four C-3 cargo ships for U. S. Maritime Commission. 465′ x 69′6″ x 42′6″ (molded); 8900 tons; 8500-hp steam turbine propulsion; cost $2,990,000. Keel laying dates, August 22, October 8, December 29, 1941, and January 22, 1942. Launching dates, December 18, 1942, and January 15, March 29, April 22, 1942.

Thirty C-3 cargo vessels.

SEATTLE PLANT

New Construction:

Twenty-five destroyers for U. S. Navy.

WESTERN PIPE AND STEEL CO.

South San Francisco, Calif.

New Construction:

Hulls Nos. 59-61, three C-1 cargo vessels for U. S. Maritime Commission. Full scantling diesel propulsion type; single screw; two Busch - Sulzer 2100-hp engines. **Delivery dates, May 16,** July 15 and September 13, **1941.**

Hulls Nos. 62-65, four C-3 cargo ships for U. S. Maritime Commission. 492′ x 69′ x 42′6″; 8900 tons; 8500-hp; steam propulsion; $2,990,000 each. Keel laying dates, February 28, May 5, August 1 and September 30, 1941. Launching dates July 15, September 15, December 5, 1941, and January 15, 1942. Delivery dates, February 24, May 5, May 15 and June 24, 1942. All above dates estimated.

Navy life floats.

Seventeen C-3 cargo vessels.

TODD-CALIFORNIA SHIPBUILDING CORP.

Richmond, Calif.

New Construction:

Thirty cargo vessels for British Purchasing Commission. 10,000 dwt; 416′ long, 57′ beam. Cost $50,000,000.

TODD-SEATTLE DRY DOCKS

Seattle, Wash.

Conversion work.

WESTERN BOAT BUILDING CO., INC.

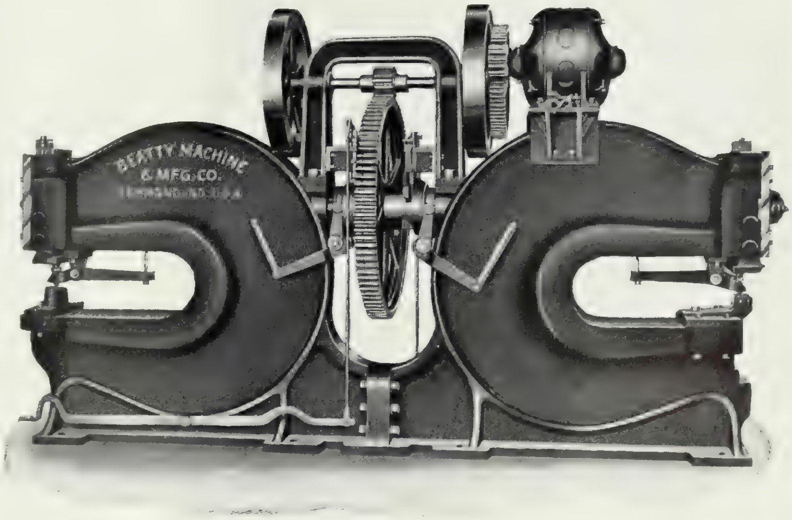
Tacoma, Wash.

New Construction:

Hull No. 144, U. S. S. Phoebe, coast mine sweeper. Completion date, May 1, 1941.

Hull No. 145, Anna M., live bait tuna boat. Launching date, April 5, 1941.

BEATTY Modernized
POWER PUNCHES and SHEARS



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Beatty Products are now being made available for Pacific Coast yards.

To meet your urgent requirements, we offer a complete line of punching and shearing equipment with superior construction advantages which will satisfy the most exacting buyer who requires machines that will stand up for years with minimum attention.

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Portable
Cranes

BEATTY MACHINE & MFG. CO. HAMMOND, INDIANA

Hull No. 146, fishing boat, 95′ x 24′ x 11′. Keel laid April 15, 1941.

Two 136′ mine sweepers for U. S. Navy. **Keel laying date, May, 1941.**

Conversion:

Fishing boats Majestic and Mahree Star, Ketchikan, Rio Del Mar, Valiant and Challenger conversion to naval use.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY
Pittsburgh, Pa.

New Construction:

Ten freight barges for Inland Waterways Corp., St. Louis, Mo. 280′ x 48′ x 11′.

Eight dump scows. 160′ x 50′6″ x 13′6″; for Panama Canal.

Two fueling scows for Carnegie Illinois Steel Co. 125′ x 26′ x 11′.

THE AMERICAN SHIP BUILDING CO.
Cleveland, Ohio

New Construction:

Twelve net tenders for U. S. Navy; (6 at Lorain, Ohio; 6 at Cleveland, Ohio). 151′8″ x 30′6″ x 16′6″; diesel-electric propulsion; contract price $6,357,000.

Four diesel trawlers for General Seafoods Corp. 146′8″ L. O. A. x 26′0″ x 14′4″. (2 at Lorain, Ohio; 2 at Cleveland, Ohio.) Delivery date, November 15, 1941.

Eight mine sweepers (4 at Lorain, Ohio; 4 at Cleveland, Ohio) for U. S. Navy; 220′ O.A. x 32′ x 17′; diesel-electric propulsion; contract price, $13,736,000.

Two bulk freighters (at Lorain, Ohio) for Pittsburgh Steamship Company; 640′ O.A. x 67′ x 35′; geared-turbine propulsion. Delivery date, October 1, 1942.

BATH IRON WORKS
Bath, Maine

New Construction:

Hull No. 182, DD437, Woolsey; 1620-ton destroyer for U. S. Navy. **Delivery date, May 7, 1941.**

Hulls Nos. 184-187, four cargo ships for American Export Lines. 400′ x 60′ x 39′. Delivery dates September and October, 1941, and April and June, 1942.

Hulls Nos. 188-189, DD457 and DD458, two destroyers for U. S. Navy. Delivery dates December, 1941, and February, 1942.

Hulls Nos. 190-195, DD449-451, 467-469, six destroyers for U. S. Navy.

Hulls Nos. 196-206, DD507-DD517, eleven destroyers for U. S. Navy.

Hulls Nos. 208-213; DD629-DD631; DD 642-DD644; six destroyers for U. S. Navy.

BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Division
Fore River Yard
Quincy, Mass.

New Construction:

Hull No. 1478, Massachusetts, 35,000-ton battleship for U. S. Navy. Keel laid July 20, 1939.

Hulls Nos. 1479, San Diego; and 1480, San Juan; two 6000-ton cruisers for U. S. Navy. Keels laid March 27 and May 15, 1940.

Hull No. 1484, cargo vessel for U. S. Maritime Commission. 450′ x 66′ x 42′3″; 16½ knots; geared turbines and water tube boilers; 14,500 tons. Launching date November 16, 1940.

Hulls Nos. 1485-1487, three tankers. 502′ x 68′ x 37′; 21,000 tons. Keels laid July 1, August 7 and September 26, 1940. Launching date, No. 1485, March 15, 1941.

Hulls Nos. 1488-1491, four tankers for Sinclair Refining Co., 10,700 tons dwt. Keels laid, No. 1488, November 21, 1940; No. 1489, March 18, 1941.

Hulls Nos. 1492-1493, two tankers for Sinclair Refining Co. 15,450 tons dwt.

Hulls Nos. 1494-1497, four heavy cruisers for U. S. Navy.

Hulls Nos. 1498-1501, four light cruisers for U. S. Navy.

Hulls Nos. 1502-1503, two light cruisers for U. S. Navy.

Hulls Nos. 1504-1507, four heavy cruisers for U. S. Navy.

Hulls Nos. 1508-1511, four aircraft carriers for U. S. Navy.

Hulls Nos. 1512-1515, four trawlers. Keels laid, Nos. 1512-1513, March 26, 1941.

Hulls Nos. 1516-1519, four 1650-ton destroyers for U. S. Navy. **Keel laying date, May 1, 1941.**

BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Division
Sparrows Point Yard
Sparrows Point, Md.

New Construction:

Hull No. 4343, Robin Kettering; cargo vessel for Seas Shipping Co. LOA 485′, beam 66′, draft 43′. Launching date January 18, 1941.

Hulls Nos. 4346, Thompson Lykes; 4347-4348; three C-1 cargo vessels. LOA 417′, LBP 395′, beam 60′, depth 37′6″. Launching date, No. 4346, December 21, 1940; No. 4347, March 8, 1941. **Delivery dates, No. 4346, April 25, 1941; No. 4347, June 15, 1941.**

Hulls Nos. 4350-4352, three cargo vessels for Seas Shipping Co. 450′ x 66′ x 34′; 6300 hp; 8500 gross tons. Keel laying dates, No. 4351, December 12, 1940; No. 4352, January 22, 1941. **Launching date, No. 4350, May 17, 1941.**

Hulls Nos. 4353-4356, four oil tankers for Socony Vacuum Oil Co. 487′6″ x 68′ x 37′; 12,000 hp, 9800 gross tons. Keel laying dates, No. 4353, August 12, 1940; No. 4354, September 12, 1940; No. 4355, April 21, 1941. Launching date, No. 4353, April 15, 1941.

Hull No. 4357, oil tanker for Union Oil Co. of Calif. 442′ x 63′ x 34′10″; 3500 hp; 8000 gross tons. Keel laying date, December 26, 1940.

Hulls Nos. 4358-4359, two oil tankers for Socony Vacuum Oil Co. 487′6″ x 68′ x 37′; 12,000 hp; 9800 gross tons.

Hulls Nos. 4360-4361, two oil tankers for Union Oil Co. 442′ x 64′ x 34′10″; 3500 hp; 8000 gross tons.

Hulls Nos. 4362-4364, three cargo and passenger vessels for Mississippi Shipping Co. 465′ x 65′6″ x 39′9″; 8600 hp; 8300 gross tons.

Hull No. 4365, oil tanker for Richfield Oil Co. 442′ x 64′ x 34′10″; 3500 hp; 8000 gross tons.

Hulls Nos. 4367-4368, two oil tankers for Panama Transport Co. 487′6″ x 68′ x 37′; 7000 hp; 9800 gross tons.

Hull No. 4369, oil tanker for Continental Oil Co. 442′ x 64′ x 34′10″; 3500 hp; 8000 gross tons.

Hulls Nos. 4371-4372, two oil tankers for Gulf Oil Co. 442′ x 64′ x 34′10″.

Hull No. 4373, tanker for Panama Transport Co. 487′6″ x 68′ x 37′; 7000 hp; 9800 gross tons.

Hulls Nos. 4374-4375, two tankers for Union Oil Co. of Calif. 487′6″ x 68′ x 37′; 7000 hp; 9800 gross tons.

BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Division
Staten Island Yard
Staten Island, N. Y.

New Construction:

Hulls Nos. 8017-8019, three C-1-B design cargo vessels for U. S. Maritime Commission.

Hulls Nos. 8021-8022, two destroyers for U. S. Navy.

Hulls Nos. 8023-8029; 8033-8035; ten destroyers for U. S. Navy.

IRA S. BUSHEY & SONS, INC.
Brooklyn, N. Y.

New Construction:

Hull No. 486, tug. 100′; 805-hp F-M diesel. **Delivery date, May, 1941.**

Hull No. 490, tug. 90′; 805-hp F-M diesel. Delivery date, July, 1941.

Hull No. 493, tug. 100′; 805-hp F-M diesel. **Delivery date, May, 1941.**

Hull No. 494, tug. 90′; 805-hp F-M diesel. Delivery date, July, 1941.

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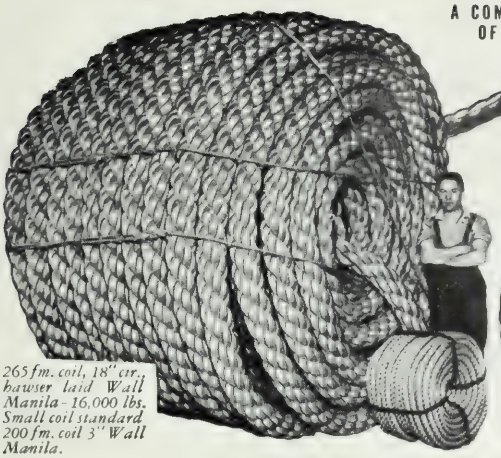
PACIFIC PAINT & VARNISH CO.
544 Market Street - SAN FRANCISCO - EXbrook 3038



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265 fm. coil, 18" cir. hawser laid Wall Manila - 16,000 lbs. Small coil standard 200 fm. coil 3" Wall Manila.

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Heavy duty Marine Cordage, Wrecking Lines, Deep-sea Hawsers, made on the longest rope-walk in the world.

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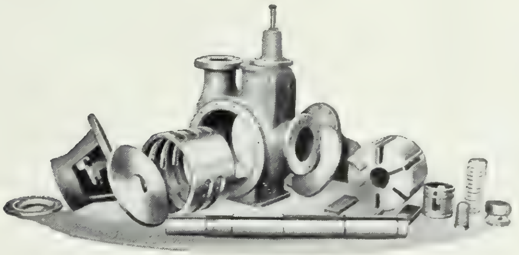

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For Tankers, Land Stations, Terminals, Oil Barges and Auxiliary Equipment.

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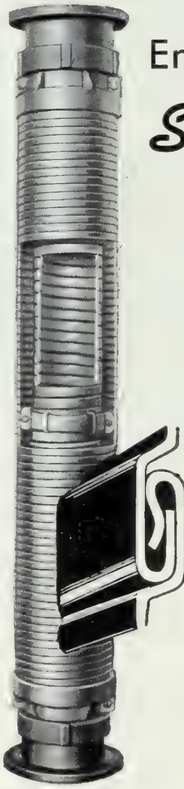

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Safety . . .

Here's double protection against those twin dangers of most exhaust systems—burns from hot pipes and "gas attacks" from cracked flanges and leaky joints. PENFLEX Air Jacketed Diesel Exhausts are hand-cool under full load conditions. Flexibility of 4-wall interlocking joint construction stops breakage of engine parts; "pipe whip" vanishes

EASY TO HANDLE

Patented arrangement of concentric tubes permits bend radii as small as 5 times tube I.D. A variety of fittings meet all manifold and muffler set-ups. No special tools are needed either for bending to shape or matching of parts.

PENFLEX Send for Bulletin 70

Tight as Pipe but Flexible

Air Jacketed Exhaust Pipes from 1" to 16"

Pennsylvania Flexible Metallic Tubing Co.
7228 Powers Lane Philadelphia, Pa.

1941 — A Shipbuilding Year!

PACIFIC MARINE REVIEW
does bring results!

Hull No. 496, tug. 90'; 805-hp F-M diesel. Delivery date, August, 1941.

Hull No. 497, tug. 90'; 805-hp F-M diesel. Delivery date, September, 1941.

Hull No. 498, 156-foot oil tanker. Delivery date, November, 1941.

Hull No. 499, 156-foot oil tanker. Delivery date, January, 1942.

Hull No. 500, wooden drydock section for Bethlehem Steel Co. Delivery date, October, 1942.

CHARLESTON SHIPBUILDING & DRYDOCK COMPANY
Charleston, South Carolina

New Construction:

Six 205' mine sweeping fleet tugs. Delivery for all within 26 months.

CRAMP SHIPBUILDING COMPANY
Philadelphia, Pa.

New Construction:

Six cruisers, Cleveland class, for U. S. Navy.

DEFOE BOAT & MOTOR WORKS
Bay City, Mich.

New Construction:

Hull No. 167, PC452, sub-chaser for U. S. Navy. 174' long Delivery date, September, 1941.

Hulls Nos. 168 - 170, YT149 - YT151, three harbor tugs for U. S. Navy. 100' long. **Delivery date, May 1, 1941.**

Hulls Nos. 171-174, four mine sweepers for U. S. Navy, 220' long.

Twelve 165-foot escort vessels for U. S. Navy.

Eight 175-foot sub-chasers for U. S. Navy.

THE DRAVO CORPORATION
Engineering Works Division
Pittsburgh, Pa., and Wilmington, Del.

New Construction:

Hull No. 1701, one welded cargo float for Pennsylvania R. R., Philadelphia, Pa. 250' x 34' x 9'1"; 594 gross tons.

Hulls Nos. 1748-1749, two type W-7 welded coal barges for stock. 175' x 26' x 10'8"; 944 gross tons.

Hulls Nos. 1774-1775, 1846-1853, ten steel lighters for U. S. Navy Dept., Washington, D. C. 110' x 34' x 11'3"; 3340 gross tons.

Hulls Nos. 1785 - 1790, six sand and gravel barges for Keystone Sand Division. 135' x 27' x 8'; 1530 gross tons.

Hulls Nos. 1801-1811, eleven gate vessels for Bureau S. & A., Navy Dept., Washington, D. C. 3410 gross tons.

Hull No. 1815, one fabricated steel hull oil barge for Pacific D. D. & Repair, San Francisco, Calif. 195' x 35' x 9'9"; 598 gross tons.

Hulls Nos. 1816-1830, fifteen type W-7 welded steel bulk cargo barges for stock. 175' x 26' x 10'8"; 7080 gross tons.

Hulls Nos. 1831-1834, four welded steel oil barges for stock. 195' x 35' x 9'9"; 2392 gross tons.

Hulls Nos. 1835-1840, six escort vessels for U. S. Army, Washington, D. C. 2010 gross tons.

Hulls Nos. 1841 - 1845, five double-bottom covered cargo barges for stock. 175' x 26' x 11'; 2650 gross tons.

Hulls Nos. 1854-1855, two welded steel deck barges for Newport News S. B. and D. D. Co. 40' x 20' x 4'; 52 gross tons.

Hulls Nos. 1856-1861, six sand and gravel barges for Keystone Sand Division. 135' x 27' x 8'; 1530 gross tons.

Hulls Nos. 1862-1867, six welded steel oil barges for stock, 195' x 35' x 9'9"; 3588 gross tons.

Hulls Nos. 1868-1869, two 25-ton floating cranes, one each to Phil. and Norfolk U. S. Navy Yards, for U. S. Navy Dept., Washington, D. C.; 670 gross tons.

Hulls Nos. 1870-1875, six welded steel deck barges for Delaware, Lackawanna & Western R. R., 100' x 30' x 9'6"; 1392 gross tons.

Hulls Nos. 1878-1902, twenty-five welded hopper barges for Pittsburgh Coke & Iron Co.; 175' x 26' x 11'; 11,800 gross tons.

Hulls Nos. 1904-1906, three welded sand and gravel barges for Cumberland River Sand Company; 130' x 24'6" x 6'6"; 579 gross tons.

Hulls Nos. 1907-1911, five 165' type AM mine sweepers for Bureau Supplies & Accounts, U. S. Navy Dept., Washington, D. C.; 1675 gross tons.

Hulls Nos. 1912-1916, five 165' type PC submarine chasers for Bureau of Supplies &

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Accounts, U. S. Navy Dept., Washington, D. C.; 1675 gross tons.

Hulls Nos. 1917-1926, ten type W-7 welded bulk cargo barges for stock; 175′ x 26′ x 10′8″; 4720 gross tons.

THE FEDERAL SHIPBUILDING AND DRY DOCK COMPANY

Kearny, N. J.

New Construction:

Hulls Nos. 168-169, CL51, Atlanta; and CL52, Juneau; two 6000-ton cruisers for U. S. Navy. Keels laid April 22 and May 27, 1940.

Hulls Nos. 179-186, eight C-2 cargo ships for U. S. Maritime Commission. Keel laid, No. 179, December 27, 1940. **Launching date, No. 179, May 29, 1941.**

Hulls Nos. 187-188, two cargo vessels for Matson Navigation Co. Keels laid November 12 and 22, 1940. Launching date, No. 188, April 12, 1941. **Delivery date, No. 187, April 29, 1941.**

Hulls Nos. 190-193, four tankers for Sinclair Refining Co. 15,000 dwt. Keel laid, No. 190, November 12, 1940.

Hulls Nos. 194-197, four destroyers for U. S. Navy. Keels laid, Nos. 194-195, December 2, 1940; Nos. 196-197, December 16, 1940.

Hulls Nos. 198-203, six destroyers for U. S. Navy.

Hulls Nos. 204-205, two destroyers for U. S. Navy.

Hulls Nos. 206-213, eight destroyers for U. S. Navy.

Hulls Nos. 214-218, five destroyers for U. S. Navy.

Hulls Nos. 219-221, three cruisers for U. S. Navy.

Hulls Nos. 222-227, six destroyers for U. S. Navy.

Hull No. 228, one C-2 cargo ship for U. S. Maritime Commission. Keel laid, February 10, 1941.

Hulls Nos. 229-230, two destroyers for U. S. Navy.

Hulls Nos. 231-232, two destroyers for U. S. Navy.

Hulls Nos. 233-240, eight cargo ships for the U. S. Maritime Commission.

Twenty-four C-2 cargo vessels.

GULFPORT BOILER & WELDING WORKS, INC.

Port Arthur, Texas

New Construction:

Hulls Nos. 167-168, two diesel-electric tugs for General Motors Corp. 100′ x 24′ x 12′4″; 1000 shp G. M. diesel and auxiliary each. **Delivery dates, No. 167, May, 1941; No. 168, June, 1941.**

Hull No. 176, diesel tug for General Motors Corp. 100′ x 24′ x 12′4″; 680 hp. Delivery date, July 30, 1941.

Hulls Nos. 181-184, four oil barges for Butcher-Arthur Corp., Houston, Texas. 150′ x 28′ x 8′. **Delivery dates, No. 181, May 1; No. 182, May 12; No. 183, May 17; No. 184, May 24, 1941.**

Hulls Nos. 185-187, three oil barges for Butcher-Arthur Corp., Houston, Texas. 165′ x 36′ x 10′9″. Delivery dates, No. 185, July 15; No. 186, July 30; No. 187, August 15, 1941.

Hull No. 189, diesel tug for General Motors Corp. 100′ x 24′ x 12′4″; 680 hp.

GULF SHIPBUILDING CORP.

Chickasaw, Ala.

New Construction:

Four 2100-ton destroyers for U. S. Navy.

Four vessels for Waterman Steamship Corporation. 445′ x 63′ x 40′6″; shelter deck type; geared turbine drive; 15½ knots service speed.

THE INGALLS SHIPBUILDING CO.

Pascagoula, Miss., and Decatur, Ala.

Pascagoula

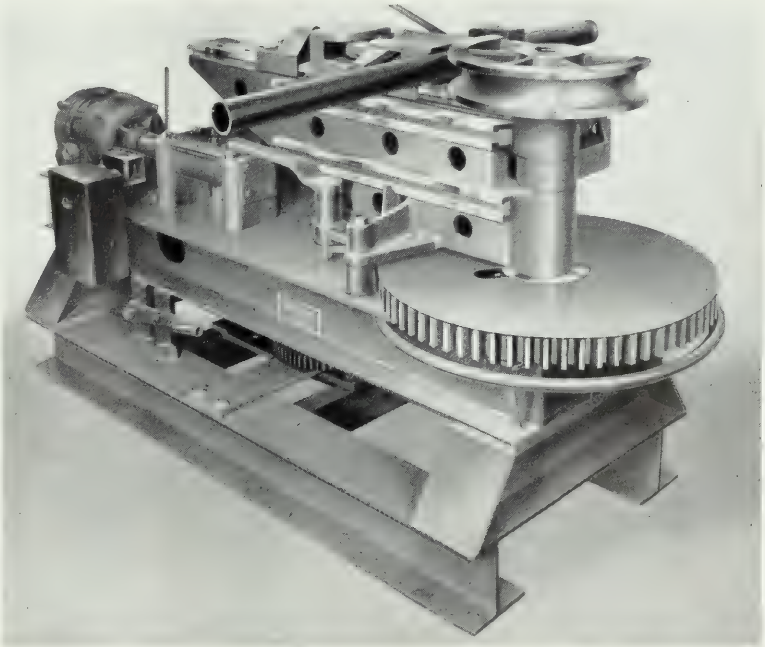
New Construction:

Hull No. 256; C-3 cargo vessel. Completion date, June 1, 1941.

Hulls Nos. 268, 297-299, four C-3-IN passenger-cargo vessels for U. S. Lines. Completion dates, May, November, December, 1942; and February, 1943.

Hulls Nos. 265-267, three C-3-P passenger-cargo vessels for American-South African Line, Inc. Completion dates, November, December, 1941; and January, 1942.

"IN A CLASS BY ITSELF"



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Of the shipbuilding firms whose orders we have on hand, we cite two who have experienced continuous use without breakdown or failure in twenty years:

Bethlehem Shipbuilding Company
Moore Dry Dock Company

U. S. PIPE BENDING CO.

249 FIRST STREET . . . SUtter 3114 . . . SAN FRANCISCO

Jobbers: Steel Pipe and Fittings   Distributors: Harrisburg Steel Flanges

Hulls Nos. 293-296, four C-3-S-A-2 cargo vessels for U. S. Maritime Commission. Completion dates, February, March, May and June, 1942.

Six C-3 cargo vessels.

Decatur

New Construction:

Hull No. 307, oil barge for Stoll Oil Refining Company of Louisville, Ky. 195' x 35' x 9'9". **Delivered.**

Hull No. 308, oil barge for Independent Oil Co., Dothan, Ala. 195' x 35' x 9'9". **Delivered.**

Hull No. 309, landing barge for Government of Venezuela. 295' x 49'3" x 7'6"; barge No. 1. Delivery date, July 1, 1941.

Hull No. 310, landing barge for Government of Venezuela. 147'6" x 34'6" x 7'6"; barge No. 2. Delivery date, July 1, 1941.

Hull No. 311, landing barge for Government of Venezuela. 60' x 34'6" x 5'; barge No. 3. Delivery date, July 1, 1941.

Hull No. 312, ferry float and ramp for Government of Venezuela. 24' x 30' x 5'. Delivery date, July 1, 1941.

Hulls Nos. 313-314, two sand and gravel barges for stock. 110' x 26' x 6'6". Delivery date, August 15, 1941.

Hulls Nos. 315-317, three 39,000-bbl oil barges for Eddie Erlbacher, Cape Girardeau, Mo. 195' x 35' x 9'9".

Hulls Nos. 318-319, two deck barges for West Virginia Pulp and Paper Co., N. Y. 105' x 32' x 7'.

Hulls Nos. AN 1-4, four net layers for U. S. Navy.

LEVINGSTON SHIPBUILDING CO.

Orange, Texas

New Construction:

Hull No. 160, tug for General Motors Corp. 85' x 22' x 9'; 800-hp diesel.

Hull No. 185, tug for U. S. Navy.

Hulls Nos. 188 and 199, two tugs for River Terminals Corp. 85' x 23' x 9'6"; 600-hp Cooper-Bessemer engines.

Hulls Nos. 190 and 196, two tugs for Sabine Transportation Co., Port Arthur, Texas. 74' x 20' x 9'; 400-hp diesel.

Hulls Nos. 194-195, two tugs for stock. 66' x 17' x 8'; 300-hp Atlas diesel.

Hull No. 197, oil barge for Pan American Refining Corp. 173' x 39' x 8'6".

Hull No. 198, oil barge for Sabine Transportation Co. 205' x 40' x 9'6" x 10'10".

Hulls Nos. 200-201, two 8500-bbl barges for stock.

Hulls Nos. 202 and 206, two tugs for stock. 74' x 20' x 9'; 400-hp Atlas diesel.

Hull No. 203, 85' coastwise tug for stock; 600-hp Atlas diesel.

Hulls Nos. 204-205; 207-210; six 8500-bbl oil barges for stock.

JOHN H. MATHIS CO.

Camden, N. J.

New Construction:

Four anti-submarine net tenders for U. S. Navy.

One bulk carrier tanker 265' long for Thos. Bowes, N. A.

NEWPORT NEWS SHIPBUILDING & DRYDOCK CO.

Newport News, Va.

New Construction:

Hull No. 378, battleship 58, Indiana, for U. S. Navy. Keel laid November 20, 1939.

Hulls Nos. 383-384, two single screw combination passenger and cargo vessels for U. S. Maritime Commission. 465' x 69'6" x 42'6"; gross tonnage about 9100 tons. **Delivery date, No. 383, June, 1941;** No. 384, September, 1941.

Hull No. 385, aircraft carrier No. 8, Hornet, for U. S. Navy. Launched December 14, 1940.

Hull No. 386, single-screw combination passenger and cargo vessel for U. S. Maritime Commission. 465' x 69'6" x 42'6"; gross tonnage about 9100 tons. Delivery date, October, 1941.

Hulls Nos. 387-388, two single-screw cargo vessels for Matson Navigation Co. 465' x 69'6" x 42'6"; gross tonnage about 7700. **Delivery dates, May 15 and July 1, 1941.**

Hull No. 389, one single-screw cargo vessel for International Freighting Corp., Inc.

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POWELL QUALITY
than meets the
BUYER'S EYE!

LARGE VALVES REQUIRE A SPECIAL SET OF QUALITY STANDARDS, SO LET'S INSPECT STEEL FOUNDRY PRACTICE IN THE MANUFACTURE OF POWELL LARGE VALVES

If a valve has to withstand pressures ranging into thousands of pounds . . . if the valve itself may weigh as much as six tons or more . . . then, to be sure, special standards of manufacture have to be followed.

From the first rough sketch on a Powell engineer's drawing board to the finished product, the self-same scientific procedure that distinguishes Powell valve manufacture in general applies to the huge steel and alloy valves needed for high pressure and high temperature service. Designs are checked and double-checked . . . materials are constantly laboratory tested for strength and durability . . . patterns are carefully made. Then, for the first actual building step—the casting.

Here in the Powell foundry, modern furnaces and skilled artisans combine to produce a valve absolutely free from porosity and sand inclusions. Every step is taken to insure quality. The metal is poured at a specified heat . . . a certain, pre-determined number of hours are allowed for cooling. Gates and risers are properly removed—casting is cleaned, then carefully inspected . . . finally, it's properly heat treated, according to analysis, for maximum physical characteristics and resistance to fatigue.

Then, on to the machining and testing departments for the last operations in the manufacture of large Powell valves . . . operations that verify the labors of the research and foundry departments, and put the final touch on valves that are *"quality through and through."* Consider Powell the next time you specify valves . . . buy value . . . buy performance.

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Will lift liquids up to 20 ft. and deliver against various pressures (in some cases up to several hundred pounds).

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Will pump any clean liquid of heavy or light viscosity.

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435' x 63' x 40'6"; gross tonnage about 8000. Delivery date, August 1, 1941.

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Hulls Nos. 395-398 (CV12-CV15), four aircraft carriers for U. S. Navy.

Hulls Nos. 399-400 (CL80-CL81), two light cruisers for U. S. Navy.

THE NEW YORK SHIPBUILDING CORPORATION

Camden, N. J.

New Construction:

BB57, South Dakota, battleship for U. S. Navy. Keel laid July 5, 1939.

AR5, Vulcan, repair ship for U. S. Navy. Keel laid December 26, 1939.

CL55, Cleveland; and CL56, Columbia; two cruisers for U. S. Navy. Order placed March 23, 1940.

CL57 and CL58, two cruisers for U. S. Navy. Order placed June 12, 1940.

AV7, Currituck, seaplane tender for U. S. Navy.

CL59-CL61, three cruisers for U. S. Navy.

CB1-CB6, six cruisers for U. S. Navy.

CL76, four cruisers for U. S. Navy.

THE PUSEY & JONES CORP.

Wilmington, Del.

New Construction:

Hulls Nos. 1080-1081, two automobile and passenger ferries for Delaware-New Jersey Ferry Co. 206' x 65' x 16'; 750 gross tons; Una-Flow steam machinery; 1400 shp; 15 mph speed. Launching date, February 1, 1941.

Hulls Nos. 1082, Hains; and 1083, Hoffman; two seagoing hopper dredges for War Dept., U. S. Engineers Office, Philadelphia, Pa. 215'10½" x 40' x 15'6"; approx. 2000 gross tonnage; diesel-electric propulsion, 950 shp. Delivery dates, February and August, 1942.

Ten C-1 cargo vessels.

SUN SHIPBUILDING AND DRY DOCK COMPANY

Chester, Pa.

New Construction:

Hulls No. 186, Rio Hudson; No. 187, Rio Parana; No. 188, Rio de la Plata; No. 189, Rio de Janeiro; four C-3 cargo and passenger liners for Moore-McCormack Lines. 492' x 69'6" x 42'6"; 8500 gross tons; diesel propelled; 8500 shp; 16½ knots. Delivery dates, August, Stepember, October and November, 1941.

Hulls Nos. 199-206, eight C-2 cargo vessels for U. S. Maritime Commission. 474' x 63' x 40'6"; 7400 gross tons; diesel propelled; 7500 shp; 16 knots. **Launching dates, No. 199, May 24; No. 200, June 21;** No. 201, July 21; No. 202, September 6; No. 203, October 4; No. 204, November 11, 1941; Nos. 205-206, 1942. Delivery dates, No. 199, July; No. 200, August; No. 201, September; No. 202, November; No. 203, December, 1941; Nos. 204-206, 1942.

Hull No. 207, Esso Williamsburg, tanker for Panama Transport Co. 547'3" x 70' x 40'; 11,300 gross tons; diesel propelled; 7500 shp; 15 knots. **Delivery date, May 15, 1941.**

Hulls Nos. 208-210, three tankers for Petroleum Shipping Co. 520' x 68' x 37'; 10,400 gross tons; turbine; 4000 shp; 13 knots. **Launching dates, No. 208, March 29; No. 209, May 10; No. 210, June 9, 1941. Delivery dates, No. 208, May 31;** No. 209, August; No. 210, September, 1941.

Hull No. 211, tanker for Atlantic Refining Co. 543'10" x 70' x 40'; 11,600 gross tons; turbo-electric; 500 shp; 13 knots. **Delivery date, April 2, 1941.**

Hulls Nos. 213-216; 219-220, six tankers for Panama Transport Co. 547'3" x 70' x 40'; 11,400 gross tons; 7500 shp; 15 knots speed. Launching and delivery dates, 1942-1943.

Hulls Nos. 217-218, two tankers for Standard Oil Co. of N. J. 547'3" x 70 x 40'; 11,400 gross tons; 7500 shp; 15 knots speed. Launching dates, No. 217, August 19; No. 218, October 18, 1941. Delivery dates, No. 217, October; No. 218, December, 1941.

Hulls Nos. 221-222, two tankers for Keystone Tankship Corp. 520' x 68' x 37'; 10,600 gross tons; turbine; 12,000 shp; 16½ knots. Keel laying dates, November 15 and December 15, 1941. Launching dates, No. 221, November 22, 1941; No. 222, 1942. Delivery dates, No. 221, January, 1942; No. 222, 1942.

Hulls Nos. 223-225, three tankers for The Texas Co. 513'10" x 68' x 36'; 9300 gross tons; turbine; 9000 shp; 16 knots. Launching and delivery dates, 1942.

Hull No. 226, tanker for Kaymar Tankship Corp. 520' x 68' x 37'; 10,600 gross tons; turbine; 12,000 shp; 16½ knots. Keel laying date, 1942.

Hulls Nos. 227-228, two tankers for Seamar Tankship Corp. 520' x 68' x 37'; 10,600 gross tons; turbine; 12,000 shp; 16½ knots. Keel laying dates, 1942.

Hull No. 229, tanker for Atlantic Refining Co. 543'10" x 70' x 40'; 11,600 gross tons; turbo-electric; 5000 shp; 13 knots. Launching date, August 4, 1941. Delivery date, October, 1941.

Hull No. 230, tanker for Atlantic Refining Co. 474' x 65' x 37'; 8000 gross tons; turbo-electric; 5000 shp; 14½ knots. Launching date, December 6, 1941. Delivery date, 1942.

Hulls Nos. 231-232, two tankers for Keystone Tankship Corp. 520' x 68' x 37'; 10,600 gross tons; turbine; 12,000 shp; 16½ knots. Delivery date, 1942.

Hulls Nos. 233 and 240, two tankers for Gulf Oil Corp. 485' x 68' x 36'; turbine propelled; 14½ knots. Delivery dates, December, 1942, and March, 1943.

Hull No. 234, tanker for Sun Oil Co. 547'3" x 70' x 40'; 11,400 gross tons; diesel propelled; 7500 shp; 15 knots. Delivery date, 1942.

Hulls Nos. 235 and 237, two tankers for Standard Oil Co. of N. J. 547'3" x 70' x 40'; 11,400 gross tons; turbine; 7500 shp; 15 knots. Delivery date, 1942.

Hull No. 236, tanker for Atlantic Refining Co. 543'10" x 70' x 40'; 11,600 gross tons; turbo-electric; 5000 shp; 13 knots. Delivery date, 1942.

Hulls Nos. 238-239, two tankers for Standard Oil Co. of Calif. 521' x 70' x 40'; turbine propelled; 15½ knots. Delivery dates, January and March, 1943.

Ten C-2 cargo vessels.

TAMPA SHIPBUILDING CO.

Tampa, Fla.

New Construction:

Hulls Nos. 37-40, four C-2 type cargo vessels for U. S. Maritime Commission. 459' x 63' x 31'6"; 9291 dwt tons.

TODD-BATH SHIPBUILDING CORP.

Bath, Maine

New Construction:

Thirty cargo vessels for British Purchasing Commission. Cost $50,000,000.

* * *

New Floating-Shaft Coupling

A new floating-shaft flexible coupling employing the L-R principle has been announced by the Lovejoy Flexible Coupling Company, Chicago, Ill.

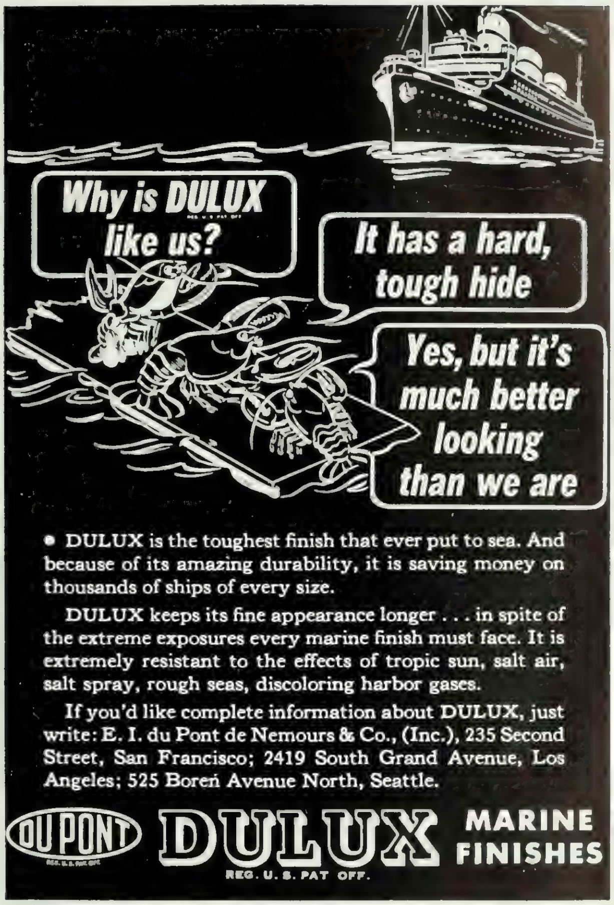
This new coupling, designated as L-R Type HKQ, is applicable to either horizontal or vertical drives, and is recommended for the longer distance drives where the space between the driver and driven units cannot be successfully handled by standard couplings; and especially where there is excessive misalignment.

The floating shaft is supported in fixed bearings, entirely independent of the power-transmitting elements—which are thus entirely unaffected by forces generated by the floating shaft itself, and do nothing except transmit useful power.

Tests show that several other advantages have been secured by this construction. One was that concentricity of the ends of the fixed shafts is permanently assured, thus entirely eliminating whipping of the ends of the shaft at any speed.

One outstanding feature of this coupling is the speed with which it can be disassembled. The operation requires merely the reversal of three to five driving bolts. This reversal automatically pulls the coupling bodies away from their adapters, creating a gap which permits the collapsed center assembly to be lifted out, without disturbance of the cushions or connected units.

Chatter caused by endwise impact of the floating shaft against the fixed shafts is prevented by suitable cushions, and free oscillation of the floating shaft—in upright as well as horizontal applications—is assured.



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- Hawaii's yesterdays are alive today! They live in lovely flower rituals. They delight the ear in Island music. Island dances dramatize them. They return with Waikiki's racing outriggers, re-enacting the sea-saga of Polynesian Vikings, who sailed into the sunrise and found Hawaii, a home so beautiful it left no further will to wander.

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(Continued from page 76-B)

pressure governing and nozzle control is arranged to open nozzle ports only as required by variations in inlet steam pressures, changes in load conditions, or both, thus assuring economical operation. If steam pressure falls below the point needed to carry the existing generator load during low-pressure operation, the units are automatically transferred from the low-pressure to the high-pressure control mechanism.

The controls and governing mechanisms are operated in individual hydraulic cylinders so interlocked that it is impossible for steam to be admitted at both inlets simultaneously. While the vessel is maneuvering and while it is in dock, high-pressure steam only will be used.

The two 350-kw turbines are of the solid rotor type construction. They will operate at a normal speed of 10,000 rpm, driving their generators through reduction gears at 1200 rpm to produce direct current at 240/120 volts.

The Danforth Mark II Anchor

Introduced to the nautical and aeronautical world in 1939, the remarkable non-fouling Danforth Anchor already has achieved an enviable reputation for sturdy dependability and unsurpassed holding power.

Tests conducted or observed by Pan American Airways and other independent authorities verify the claims made by the manufacturer and indicate a holding power of two hundred or more pounds per pound of anchor weight.

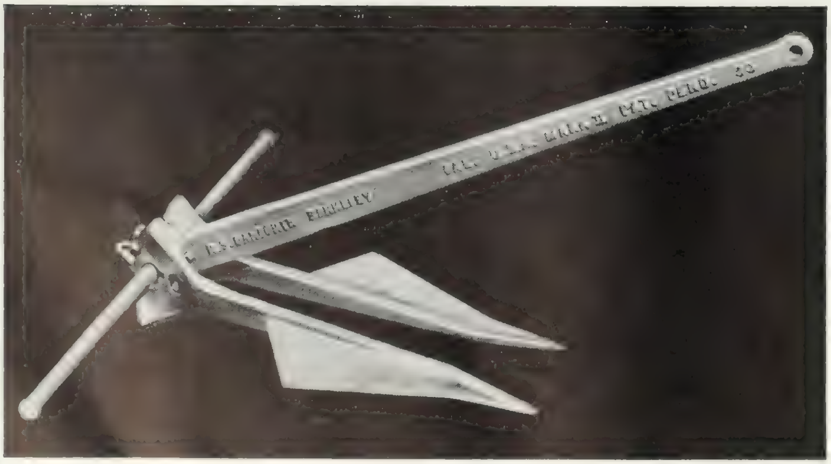
This performance is phenomenal when considered in the light of the best previous records of other conventional and patented type anchors.

The average commercial stockless anchor has a holding power of only two or three pounds per pound of anchor weight, with up to six pounds per pound of anchor weight for stockless anchors of special design.

The maximum holding power of ordinary kedge type anchors varies from four to ten pounds per pound of anchor weight. Special type kedges, such as those developed by the British Royal Air Force, have shown ratios as high as sixty to one, according to figures published by officials of the British Air Ministry.

In other words, the Danforth, with a tested holding power of more than two hundred pounds per pound of anchor weight, shows an improvement of 30 to 70 times over the holding power of conventional anchors.

The Mark II is self-burying. Special pivoting flukes are close to the shank; they act as a single fluke so that the small stock stops rotation. The anchor goes down through soupy mud into firm holding ground; in some instances, on bottoms having a thick layer of soft overlying sand, not only the entire anchor, but also as much as twenty-five feet of ¾″ Manila cable, have been carried below the surface of the mud by a 29-lb. Danforth! This self-burying characteristic makes the Danforth non-fouling. In other words, the stronger the pull, the deeper it digs and yet breaks out easily on a vertical pull.



Danforth Mark II anchors

Danforth anchors in many sizes have been tested and are now on duty in the U. S. Navy, U. S. Army, and U. S. Coast Guard. For example, they are used on the new motor torpedo boats built by Higgins Industries, Inc., New Orleans, which firm has purchased more than one thousand Danforth anchors during the past eight months.

Pan American Airways engineers, in some of the tests observed by them, report that the new 28 lb. Danforth Mark II decreased anchor weight 55 per cent . . . increased holding power 135 per cent, as compared to the 70 and 80 lb. anchors they had been using. New Danforths have now been furnished for all Clippers on the Pacific routes and all new Pan American Clippers under construction.

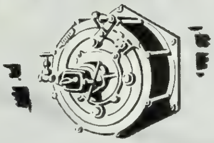
Three anchors are manufactured in cast alloy steel and nickel chrome steel in sizes from 15 lbs. to 20,000 lbs.

Micro-Action Valve For Governors and Gages

For dampening the pulsation of boiler plant pump governors and to eliminate "jitters" of the gage hand, a novel device known as the Campbell Micro-Bean has been developed. It can be installed on the pressure line to the diaphragm of a pump governor for protection of the pressure gage mechanism and tube, also the spring, diaphragm and stem packing. It is also effective as protection to any control valve, such as a back pressure or reducing regulator and for use with sensitive control instruments subjected to pulsating flow. The valve will handle steam, fuel oil, gas, water or other liquids, with simple adjustment for each viscosity.

The Micro-Bean consists of a solid brass body in which a filter is inserted for protection from foreign matter. The valve has an extremely slight taper so that very sensitive control of

TODD COMBUSTION EQUIPMENT



Installations individually engineered to a high point of efficiency and dependability in the firing of marine boilers by liquid fuel . . . industrial and commercial boilers by liquid or gaseous fuel. Consultation invited.

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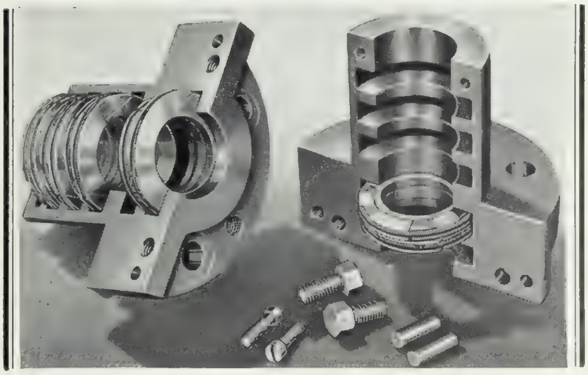

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the shut-off is effected. This slight taper minimizes the tendency to pinch off, under changing pressure conditions,to approximately two per cent of what is usual in an ordinary valve, according to the inventor.

The micrometric control of the opening enables the operator to obtain the closest approach to full shut-off down to the last .0003 of an inch, regardless of the line content. In the Micro-Bean the solid metal body is said to minimize the effect of body strain. A 48-to-1 taper of the valve minimizes the effect of stem and screw compression strain.

This device is universal in application for varied purposes up to 3000 lbs. pressure and will give any degree of stabilization desired by merely turning the valve. Any scoring which might eventually take place (it is microscopic), can be simply ground out by shutting off the valve completely two or three times.

The device is manufactured by J. A. Campbell Co., Long Beach, California. Literature is available.

Test Pump For Fire Extinguishers

For the first time an approved testing device, known as the Testall Pump, is available for determining the maximum safe life of fire extinguishers. Previously unsafe extinguishers may have been inadvertently continued in service; or good ones discarded prematurely.

The Testall Pump tells exactly the condition of each extinguisher by testing hydrostatically the shell and hose for strength, through the hose and nozzle. It is approved by the Factory Mutual Laboratories with a definite procedure for testing: (1) extinguishers, (2) engines, (3) hose, (4) sprinkler systems.

As the Testall Pump flushes interior and exterior of the extinguisher, the testing work can be readily combined with regular maintenance. Flushing and testing water flows automatically through the pump, without the pump's operating.

According to the manufacturer, American-LaFrance-Foamite Corporation, Testall Pump is rapid in operation and can be carried easily by one man.

New Insulating Fire Brick

A new line of insulating fire brick for the temperature range from 1600° to 2600° F has just been announced by Johns-Manville, designed for direct exposure in a wide variety of furnaces, ovens and other heated equipment, except where subject to slag action or mechanical abuse. The brick is furnished in four temperature limits: JM-16, for exposed service to 1600° F and for back-up service to 2000° F; and JM-20, JM-23, and JM-26 for exposed or back-up temperatures to 2000°, 2300° and 2600° F, respectively. The new line supplements the Johns-Manville Sil-O-Cel series of back-up insulating brick for temperatures of 1600°, 2000° and 2500° F.

The new insulating fire brick is produced from a plastic refractory clay and an organic filler which, upon being burnt out during the manufacturing process, gives a uniform, controlled pore structure to each of the various types, and imparts the characteristics of light weight, strength, and high insulating value.

Production of the new brick has been recently started at Zelienople, Pennsylvania, in Johns - Manville's newest plant, which was rushed to completion ahead of schedule to meet the need for such materials in the industrial expansion program for defense.

Condens-O-Weld Welding Control

For welding aluminum and alloys such as are used in the aircraft industry, a new capacitor discharge resistance welding control is announced by Westinghouse Electric and Manufacturing Company.

Known as the Condens-O-Weld, this unit is a complete control designed to include in one floor mounted cabinet all the necessary apparatus required to control an electrostatic energy storage type of welder. Accessories not included are foot switch, pressure regulator and pressure gage since these items are normally supplied by the welding machine manufacturer.

The Condens-O-Weld is designed for operation on 230/460 volts ± 10 per cent, 3 phase, 50 or 60 cycles. The charging circuit and its control charges a 2640 mfd capacitor bank to 3000 volts. Spot welding speeds of 40 to 80 spots per minute are obtained depending on the size of capacitor bank.

Charging the capacitor may be taking place during the entire time interval between successive welds, thus reducing the power demand to a minimum. When used with certain welding machines, line kva demands as low as 1/10 of that taken by a typical single phase ac aluminum welder are possible.

Ice Test For Lubricant Pumps

To prove that the new 1941 Alemite barrel pumps will operate as well in winter temperatures as in fair weather, Stewart-Warner engineers have devised a grueling test for pump performance.

In a recent test simulating abnormal weather conditions, engineers placed a stock 1941 Alemite high pressure pump and a 100-pound drum of extra heavy fibrous type lubricant in a tank of water. Then pump, drum and tank were placed in a refrigeration plant for several days, the water freezing into a 1000-pound block of ice completely encasing the pump and drum of lubricant. The pump not only operated under these drastic conditions, but actually delivered lubricant, fast enough and in amounts more than necessary to lubricant automobiles, at 6000 pounds pressure per square inch.

The Alemite division of Stewart-Warner Corporation is credited with originating high pressure lubrication in 1916. It is now the largest manufacturer of lubricating equipment in America. The 1941 Alemite high pressure barrel pumps offer several new exclusive features including the Dynamatic primer, Aldura air valve and the "Hose Miser," which automatically releases pressure in the grease hose when air line is disconnected.

Condenser Packing Stocks at Los Angeles

In order to provide more complete and quicker service for the Southern California marine industry, the Crane Packing Company's Los Angeles office announces that condenser packing will be carried in stock. R. G. Roshong is Southern California manager for Crane Packing Company.

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When Clear—Burn blue light or give four flashes on Morse lamp.
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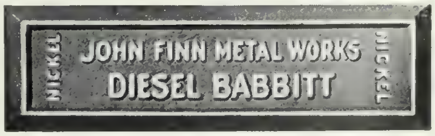

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The Catalogs of Today Become the Technical Handbooks of Tomorrow

Flexible Metal Hose, an attractive loose leaf binder with catalog sections covering the products of the Pennsylvania Flexible Metallic Tubing Company, known as the Penflex line. The sections are titled: Flexible piping for air, oil, steam, gases and volatiles; bronze steam hose and clincher couplings; galvanized steel hose and couplings; exhaust pipes for diesel engines; all-purpose hose; lightweight general utility hose; all metal hose for tank car unloading; all-metal hose for barges and tankers; Penflex automatic barrel filler; Penflex pneumatic rivet passer; and how to select Penflex.

◆

Mechanize your drawing board, a four-page leaflet illustrating and describing the Master Drafto drawing machine as manufactured by the Drafto Company.

◆

Rodpack Metallic Packing, a four-page leaflet describing and illustrating the special features and the application of a floating seal type metallic packing adapted for either reciprocating or rotating rods and manufactured by the Rodman Manufacturing Company of San Francisco.

◆

Spot Welding Timers (desc. data 18-335), Ignition spot welding timers to control welding of aluminum, heat treated alloys, and other materials are described in a new leaflet announced by Westinghouse Electric and Manufacturing Company.

Application, distinctive features, and construction are discussed. Tubes and other important parts are described. Operating details list the functions of tubes and relays and explain how stepless welding is accomplished. Outline sketches give physical dimensions and show position of conduit connections.

New Process Steel, an 8-page booklet, just issued by Jessop Steel Co., describes their "New Process" cold header die steel, a clean, non-porous steel developed especially to meet the severe service conditions encountered when cold-heading bolts, screws, rivets, nails, buttons, and other small metal objects. Complete information on the heat treatment of this steel has been included.

◆

Sound Levels and Fan Selection, a new booklet, written in non-technical language, on the subject of sound levels and other related factors governing selection of axial flow fan units, just published by the De Bothezat Ventilating Equipment Division of American Machine and Metals, Inc.

Methods of rating noise levels in decibels, comparison of various sound reference levels, influence of fan tip speeds and effect of distance on noise readings are among some of the interesting points discussed in this unbiased approach to a better understanding of the factors governing proper fan selection for specific sound level limits.

◆

Technical Data Card No. 112, an 8½" x 11" card of easily read millimeter to inch conversions from 1 mm. to 300 mm. and a comparison of metric-English measures of weight and length may be obtained from The Babcock & Wilcox Tube Company, Beaver Falls, Pa.

◆

Pyrene G-1, a descriptive folder has just been issued by the Pyrene Manufacturing Company describing how the national emergency has finally produced an extinguishing agent that puts out magnesium fires in industry and in incendiary bombs. This new substance, known as Pyrene G-1 Fire Extinguishing Powder, is the result of combined research by the Dow Chemical Company, Midland, Mich., manufacturer of magnesium alloys, and the Pyrene Manufacturing Company, Newark, N. J., fire protection engineers and extinguisher manufacturers.

In addition to incendiary bombs, the use of magnesium alloys has skyrocketed in aircraft and other defense production. Protection against metallic fires, therefore, is a national necessity. Usual extinguishing methods, however, do not work. Makeshift substances such as talc, soapstone and sand are unsatisfactory. Water or any substance containing moisture increases the speed of combustion, sometimes with explosive violence.

The new product, Pyrene G-1 Fire Extinguishing Powder, is a dry inert compound that stops the combustion of magnesium as well as other metals such as sodium, potassium, aluminum and zinc. It also contains a material which, when heated, forms a heavy, air-excluding, fire-smothering vapor. The powder is applied to the fire by spreading it with a scoop or shovel. Being non-abrasive, it may be used freely around machinery.

◆

Catalog Section 43-414, describing improved ac and dc ammeters and voltmeters for general use is a new 12-page bulletin announced by Westinghouse Electric and Manufacturing Company. These ammeters are available in ranges from five to 125 amperes and the voltmeters in ranges from 90-140 to 450-700 volts.

Switchboard, portable, wall, and socket types are described, special attention being given to application. Operation and construction details are explained.

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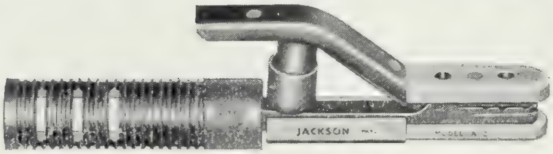

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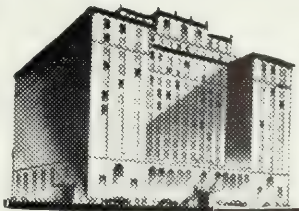

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WASHINGTON
Frank W. Hull
MANAGING DIRECTOR

List prices are quoted for all meter ratings and styles. Physical dimensions are given on outline sketches which show mounting details. Typical one and six day charts are illustrated.

◆

Smooth On Cements, how to make practical, low-cost and lasting repairs to equipment and pipe lines without dismantling or use of heat, described in a new and revised edition of the Smooth-On Handbook.

Forty pages with 170 diagrams and simple concise instructions on sealing cracks in castings, stopping leaks in apparatus, tightening loose fixtures and parts of equipment, making up tight pipe joints, patching concrete floors and walls, waterproofing cellars and cisterns.

A helpful repair guide for engineers, mechanics and maintenance men.

◆

The Permochart Company, Sewickley, Pennsylvania, have issued a four-page folder on their Vinylite plastic "Permochart," a recording instrument chart designed for continuous re-use.

This folder contains information regarding chart construction details, installation and prices. Sample "Permochart" is enclosed to illustrate how daily ink record is easily removed from the chart surface with a damp cloth, enabling continuous chart re-use.

◆

Spray Painting and Finishing System, Catalog "IE" just issued by the DeVilbiss Company of Toledo. A booklet that covers, in condensed form, the complete line of standard spray-finishing equipment, for industrial use, manufactured by this firm.

The new catalog brings all prices and specifications of the company's industrial line up to date.

◆

Fiberglass in the Merchant Marine, booklet No. 5.2.22 of the Owens-Corning Fiberglass Corporation. This interesting, well-illustrated pamphlet is published to give the shipbuilders a concise summary of Fiberglass products on board merchant ships.

This material has exceptionally high qualities for electrical, thermal and acoustical insulation, and in addition is incombustible and does not absorb moisture.

It is now manufactured in blankets, bats, tapes, cloth, rolls, blocks, pipe coverings and cements. For special uses such as turbine casing insulation, Fiberglass may be obtained in blankets tailored to fit, removable, cleanable, replaceable and easy to handle.

◆

A-C Adjustable Speed Drive, Bulletin DD-4063. Ac adjustable speed drives between one and 15 horsepower for use over wide speed range are described in a new 4-page bulletin published by the Westinghouse Electric and Manufacturing Company.

Simplicity, reliability and overload protection features are discussed. The method of operation and speed maintenance are explained. The electrical arrangement of parts is shown by a circuit diagram.

Design details of motor-generator, dc drive motor, and rheostat are given with data on ratings, speed ranges, and starting torque. Typical curves show variation in percentage torque with speed.

◆

Unitized Switchgear Bulletin B-2273. Unitized light-duty metal-clad switchgear for control stations and industrial plants are described in a new 24-page bulletin published by Westinghouse Electric and Manufacturing Company.

Standardized units to meet all light-duty switchgear requirements for circuits up to 5000 volts are covered. Manufacturing features and operating details are explained and illustrated, De-ion circuit breaker action, control devices and busses are fully described.

Complete specifications for each unit are given. These include stationary structure, busses, disconnecting devices and circuit breaker units.

Valvoline Recommendation Handbook. Valvoline Oil Company is celebrating its Diamond Jubilee year with a very interesting handbook of lubricant recommendation charts for models 1936-1941 in automotive units, and 1936-1940 in marine engines.

The Marine Section not only shows Summer and Winter SAE recommendations for engines from Alco and Amphion to Winto, Wisconsin and Wolverine; it also has interesting discussions of various aspects of marine lubrication, including how to avoid oil sludging, excessive dilution and wear, carbon deposits, oil pumping and excessive oil consumption. The book also gives recommendations for outboard motors and the amount of oil per gallon of gasoline for four types of horsepower in ordinary service, and for motors classes A to F in racing service.

◆

Franklin's Chekit. The Franklin Research Company of Philadelphia announce a new and completely illustrated folder on this line of wood finishes. This descriptive piece of literature discusses: types of floors to be treated; accepted and approved methods of treating floors, and just what a consumer has the right to expect from a certain type of seal.

A unique feature in the folder is its illustrations. Floors of a brokerage trading room, gymnasium, ball room, lounge, apartment house, and a completely paneled room are clearly pictured.

◆

Standardizing for Top Results (Form 6683) is the title of a new booklet just released by Caterpillar Tractor Co. of Peoria, Illinois.

Photographs of diesel power making sport of sturdy, he-man tasks are prominently displayed along with descriptions of accomplishments, stressing that "Caterpillar" products require less mechanical attention and the parts and service organization behind them is unexcelled in the business.

◆

Form 4694, a new 12-page, illustrated booklet, ***"What the Purchasing Agent Should Know About Oxy-Acetylene Welding and Cutting Equipment and Processes,"*** has just been announced by The Linde Air Products Company, a unit of Union Carbide and Carbon Corporation. The booklet is designed to help the user or prospective user obtain a clear understanding of the oxy-acetylene process and the various construction and operating features of welding and cutting apparatus used in applications of the process. It contains a guide to the selection of the proper type of equipment, with a check list of important points to consider in selecting welding and cutting blowpipes, cutting machines, regulators, and acetylene generators. Also included is a listing of some of the modern applications of the oxy-acetylene flame, suggesting the many uses to which it may be put.

Pacific
MARINE
REVIEW

July, 1941

On the Job with America's Defense

PHOTO COURTESY
AMERICAN-HAWAIIAN
STEAMSHIP COMPANY

MERCHANT MARINE

As Pacific Coast ship operators realize so well, nothing is more vital to America's defense than the American Merchant Marine.

No wonder, then, that this merchant marine is being expanded as rapidly as possible to be able to take over the task of carrying much of the world's water borne commerce.

As for generations past, today's growing Merchant Marine on Pacific Waters is largely outfitted with Tubbs and Portland Marine Rope . . . rope that has proved its ability to stand up under even the most exacting of conditions.

Just as they are on the job with America's defense, you will find the Tubbs and Portland trademarks dependable brands to look for and specify—under stress of emergency as well as under normal conditions.

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TUBBS CORDAGE CO. • **SAN FRANCIS**

PORTLAND CORDAGE CO. • **SEATTLE - PORTLA**

Pacific
MARINE
REVIEW

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OUR COVER

Reproduced from a very striking photograph, our cover presents S.S. Mormacsun, the latest product of the Moore Dry Dock Co. and owned by Moore-McCormack Lines, Inc. She is a C-3 cargo steamer of 17,600 tons displacement and carries approximately 10,000 tons of cargo at a sustained speed of 16½ knots.
(Photo by Moulin Studios, San Francisco)

Official Organ
Pacific American Steamship Association
•
Shipowners Association of the Pacific Coast
•

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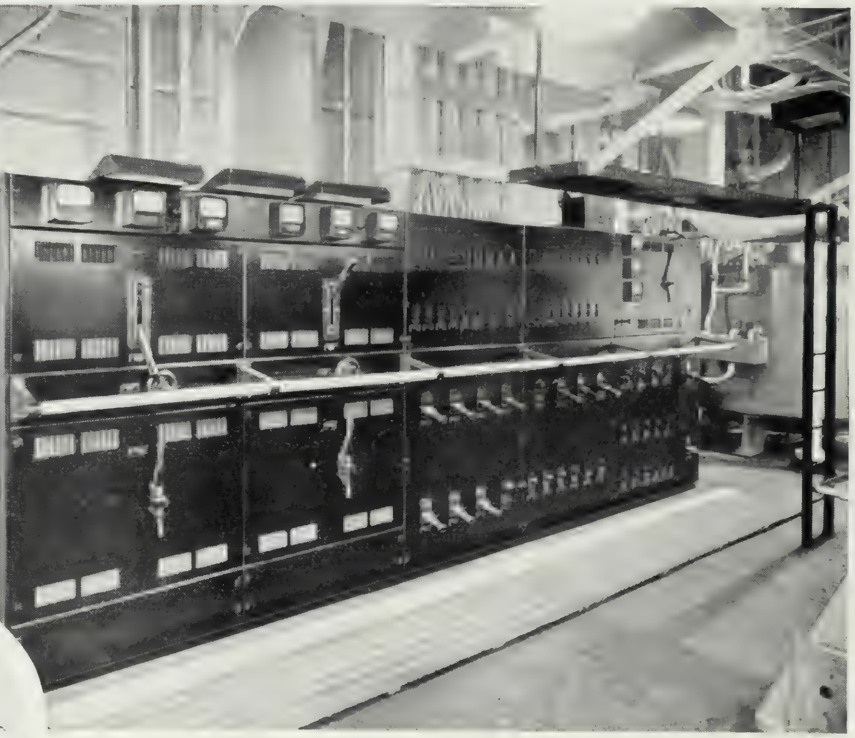
It's by I-T-E

This modern electrical switchboard on the "Mormacsun"

It is a good example of latest I-T-E practice in designing switchgear for marine service



Built as a complete unit.

Delivered as a unit ready to install.

All circuit breakers are built-in, full-enclosed in steel.

To the modern ship, I-T-E* brings more than 40 years of specialized work in the design and construction of marine switchgear for protection and control of circuits, connected apparatus and men. Each I-T-E advance in circuit breakers, in switchboard structures or in control arrangements is reviewed by our engineers in the light of its usefulness for service aboard ship. This consistent effort results in our readiness at all times to apply the most modern practice in full keeping with the requirements of the U. S. Maritime Commission and A. B. S. rules.

Before the onset of new demands for switchgear, our factory facilities and personnel were expanded. With our business at an all-time peak, I-T-E is able to effect scheduled delivery of new switchgear for marine installation.

The switchboard shown above protects and controls two 300 KW, 3-wire, 120-240 volt d-c generators together with power feeders, lighting feeders and shore connections. Included are two 1600-ampere Type LX circuit breakers equipped with algebraic overload protection. All feeder circuits are protected by Type ET, thermal-overload circuit breakers.

*Includes Walker Switchboard Division, which was formerly Walker Switchboard Company.

Representatives in Principal Cities

I·T·E CIRCUIT BREAKER CO., PHILADELPHIA, PA.

Pacific Marine Review

Editorial Comment

Shipping Priorities and Control

American shipping is now practically on a war footing. Every action of every coastwise, intercoastal or overseas operator, every movement of every ship is based on the existence of an "unlimited national emergency."

Constantly the fleets of private operators are being reshuffled to take care of "defense materials."

New enabling acts for more drastic control are being pushed through Congress by the administration.

Rates are frozen by an order of the Maritime Commission.

Most of the larger operators have voluntarily discontinued publication of sailing dates.

Shortage of space for commercial cargo is very acute in practically all trades. Intercoastal operators say they are being offered three times the cargo they can handle.

National Defense and Lease-Lend imports have priority on all space available. One result is a growing shortage in certain raw materials for commercial manufacture.

Thus, although we are not at war, and our chief executive says he "hopes to keep us out of war," we are right now strictly on a war economy basis in all of our shipping and industrial relations.

Even the "sacred safety at sea" legislation, covering load lines, is to be altered in favor of emergency. The Secretary of Commerce, by an act now pending, may allow lessening of freeboard and deeper draft to ships in the interest of greater capacity for ships carrying "defense materials." Harold Ickes, Petroleum Coordinator, estimates that this measure applied to tankers would mean a potential annual addition of 10 to 15 million barrels of oil to Atlantic Coast ports. Incidentally, if every family in the United States had foregone the automobile jaunt over the present Fourth of July week end, the resultant savings would have included some 5 to 6 million barrels of gasoline, some hundreds of lives, hundreds of thousands of man hours and hundreds of thousands of dollars in repair bills.

Another act would permit a lowering of the percentage of able seamen required in a ship's crew, thus discounting the shortage of experienced trained personnel.

Although officially at peace, we of the United States are now working on a basis of war economy in all foreign and domestic commerce and industry. The question naturally arises, "What kind of economy will be further imposed when we enter the shooting phase of this type of peace?" That question apparently finds no answer, which leads American business men to ask another equally answerless question, "When the shooting phase is over and official peace again holds sway, will we return then to the same war economy we now have?"

Shipbuilding Labor

The largest problem facing the American shipbuilding industry today is skilled labor. Those in the best position to know estimate that the industry will need an additional 350 to 400 thousand skilled personnel before the end of 1942.

This is a large order and many methods are being used to produce this tremendous increment.

Every shipbuilding center is now having a large crop of commercial schools, charging quite healthy fees for instruction in the various trades required.

Practically every available public trade school is prepared to give instruction and most of them are receiving aid in this work from the Federal treasury.

All of the old established shipyards and many of the new yards are maintaining schools for shipyard welding technique and for other trades.

The Pacific coastwise agreement between the shipyards and organized labor puts the mandate of a "closed shop" on the industry. To take care of the need for new skilled workers, this mandate is modified. The shipyard needing more men in any trade must first apply to the union for those men. If within 48 hours the men are not supplied by the union, then the shipyard can employ any men it can get. The men thus employed must apply for union membership and the union must admit them.

Executives of the shipbuilding industry are confident that they will be able to solve this labor problem and meet production schedules.

Russia and Pacific Ocean Shipping

The attack on Soviet Russia by the Axis powers brought an immediate promise from the President of the United States that America would send all possible aid to Russia. The only present practical road on which such aid may reach Russia is the transpacific-transsiberia route via Vladivostok.

The use of that route direct with any considerable volume of cargo presents new problems for American-Pacific shipping and would mean a considerable reshifting of tonnage and a greater volume of cargoes passing through Pacific ports.

The U. S. Department of Commerce recognizing this problem issued an interesting statement covering information and data on the merchant marine of the U. S. S. R., and on their rail transportation system. We reproduce this statement in full, herewith:

"As of July 1, 1938, the last full pre-war year, Russia ranked 11th among the world's merchant marines in point of tonnage, having a total of 678 vessels with an approximate gross tonnage of 1,370,000 tons. This slightly exceeded the tonnage of Denmark at the time, and was surpassed by the merchant marines of Great Britain, the United States, Japan, Norway, Germany, Italy, France, the Netherlands, Greece and Sweden, in that order.

"The Soviet merchant marine included, at this date, 8 barges, 2 sailing vessels, 13 combined sailing vessels and diesel-motored ships, 1 combined sailing and steam ship, 503 steamers of which 7 were sidewheelers and 141 vessels propelled by diesel engines.

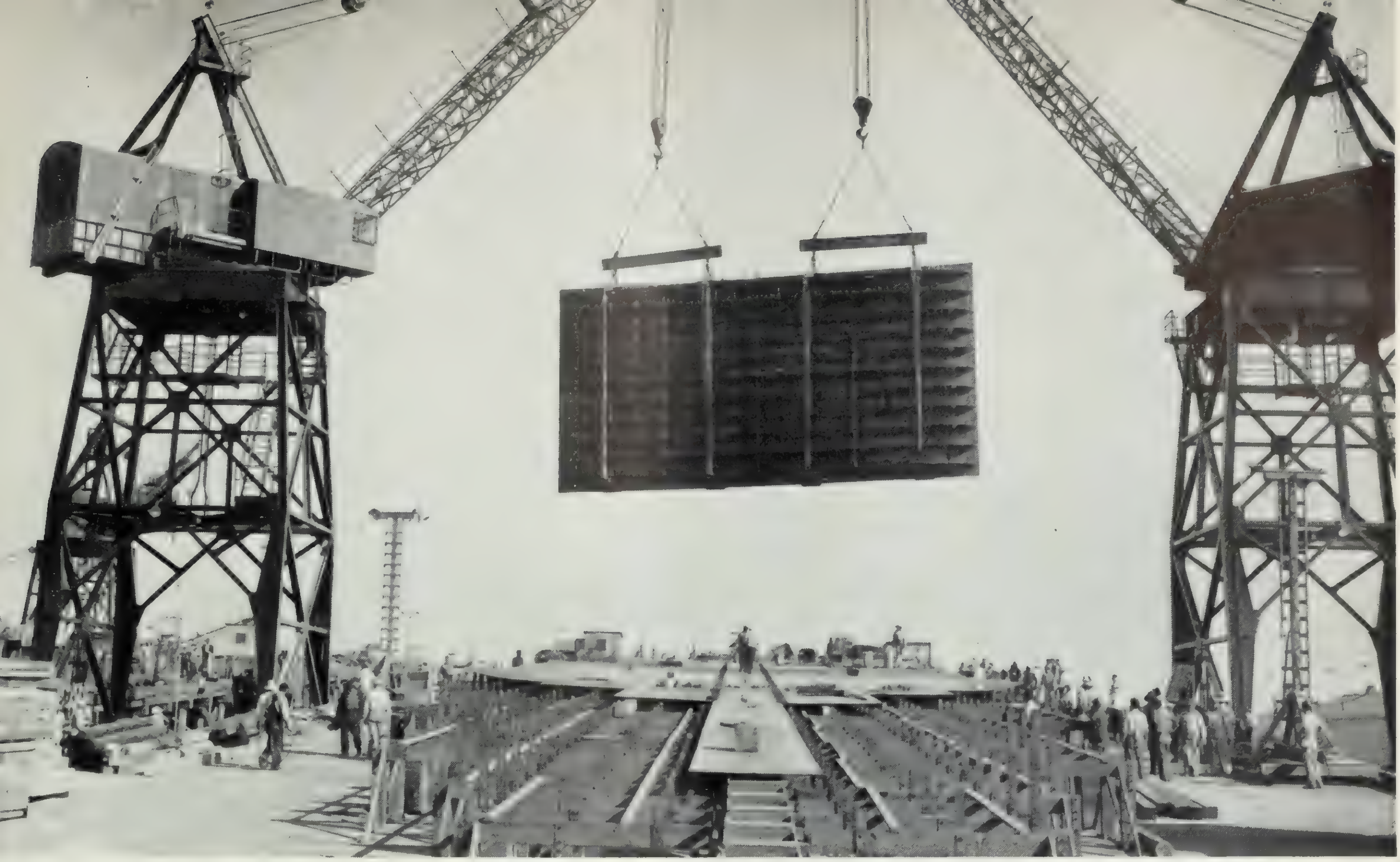
"During the four years prior to 1938, a total of 52 ships were put in operation. Of the total number of ships, only 216 were built in Russia, 143 were constructed in England, 120 in Germany, 43 in Holland and 33 in the United States. Ninety-five ships, or 36 per cent of the total number were over 20 years old in 1938, and only 16 ships were reported to have a speed exceeding 12 knots.

"After a voyage of some 4500 miles across the Pacific, requiring 15 to 16 days for ships at moderate speed, United States shipments to Vladivostok have another 5780 miles to travel via the 5-foot gage, double-tracked Trans-Siberian Railway to reach Moscow. Wide gage of the Russian railways would preclude use of existing United States rolling stock to increase transportation facilities over the land route.

"Capacity of the Trans-Siberian Railway is not revealed. However, it is significant that press reports from apparently authentic sources in the Far East state that as recently as June, 1941, Japan was supplying Germany with a total of 1500 tons of raw materials daily over the Trans-Siberian route, which, of course, represents only a portion of the total travel. It was reported that about 8000 freight cars of 20 metric tons capacity each were engaged in the trade between Germany and the Far East. A study of the Trans-Siberian Railway by the Department of Commerce issued in January, 1940, noted that freight shipped from the Far Eastern economic area served entirely by the Trans-Siberian increased from 5,400,000 tons in 1932 to 15,600,000 tons in 1937, an increase of almost 300 per cent.

"Running time for de luxe passenger trains over the all-Russian route from Vladivostok to Moscow is reported at about 9 days. Freight trains, averaging 30 cars, would require a longer time, but in wartime may have precedence over passenger traffic."

From the above figures, it would seem that if the entire present capacity of the Trans-Siberian R. R. were used for shipment of munitions of war, it would be possible to take care of 15,000 to 20,000 tons a day, or, say, three shiploads. The turn around for the voyage, out and back, would approximate 40 days. To meet the railroad capacity it would be necessary to get 120 ships or more on this route, some Russian and some American.



Here she comes! First double-bottom assembly being swung into position in Hull No. 1 on Slip No. 1, California Shipbuilding Corporation, Terminal Island

55 "Liberty Fleet" Ships Building at Terminal Island

Down at Terminal Island in Los Angeles Harbor, something is happening. Something, one could say and still be conservative, that is little short of amazing.

The kind of thing that is happening today not only here, but, with our national safety threatened, is happening also throughout these United States, when keen minded, ingenious, enterprising Americans, with broad records of accomplishment already behind them, are stepping forward now to help do "the biggest job of all"—the protection of the liberties of free men.

At the shipyards of the California Shipbuilding Corporation on Terminal Island, now rapidly being completed, 55 of the Maritime Commission's new EC-2, 10,000 ton "Liberty Fleet" cargo vessels are to be launched within the space of some 14 months. The first launching is scheduled for early October, the last of the 55, originally scheduled for delivery by March, 1943, under accelerated schedule, will actually be delivered months earlier. That's at the rate of a ship every week or less. All from one yard!

"Calship" is, in fact, the Maritime Commission's second largest emergency program shipyard in the country.

Perhaps you know the story back of this great undertaking. A story born of the ravages of war. A story typifying the challenging response of American industry when outside dangers threaten.

Last winter the shipping plight of our neighbors across the Atlantic began to look very serious indeed. And, to the minds of most of us, their danger appeared increasingly to be our danger too.

Acting upon this assumption, last winter our Government set up an emergency program for 200 cargo ships, simplified in type, partly prefabricated, quick to build. Searching for yards in which to build these ships, the Maritime Commission came to the Todd Shipyards Corporation and a group of western contractors, who

S. D. Bechtel, president of "Calship," U. S. Maritime Commission's second largest emergency program shipyard

John A. McCone, vice president and general manager of "Calship," under whose direction 55 EC-2 ships will be built

jointly formed the California Shipbuilding Corporation of Wilmington, California.

Banded together in this group with Todd were the W. A. Bechtel Co., Bechtel-McCone-Parsons Corp., Henry J. Kaiser Company, the Utah Construction Company, McDonald & Kahn Co., Ltd., Morrison-Knudsen Company, Inc., J. F. Shea Co., Inc., General Construction Company and the Pacific Bridge Company—all identified with great construction projects throughout the Pacific area.

Proceeding with necessary rapidity, on January 11th of this year a contract for 31 of these EC-2 "Liberty Fleet" oil-burning ships, 427 feet in length, with a 10,500 dwt and a speed of 11 knots, was placed with the California Shipbuilding Corporation.

Quickly to provide means for building these emergency ships, contracts for facilities construction were shortly placed and work started early in February on the "Calship" yard on Terminal Island.

By April of this year U-boat and bomber toll had made such heavy inroads on British shipping that, in order to extend greater aid to Britain under the Lease-Lend bill, a second Government emergency ship program developed calling for 212 additional cargo vessels, 112 of them to be of the EC-2 type.

Of this program "Calship" received a contract for an additional 24 ships, making a total of 55 ships in all awarded to this Southern California yard.

Under the leadership of President S. D. Bechtel, president of W. A. Bechtel Co., and the direction of John A. McCone, vice president and general manager of the California Shipbuilding Corporation and president of Bechtel-McCone-Parsons Corp. (the engineering organization which designed the shipyard), this great shipbuilding project which had gotten under way in January of this year, on February 19 signed a five-year lease on an 86-acre tract of semi-tide land on Cerritos Channel, Terminal Island, with the Los Angeles Board of Harbor Commissioners, which area was later enlarged to 97 acres and 3000 feet water frontage following receipt of the second contract for additional ships.

There has followed one of those amazing feats of engineering and construction efficiency and speed that have come to be synonymous with American industry when skilled leadership and highly organized personnel are combined with the most modern equipment to do a big job, do it well, and *do it fast*.

Immediately on the awarding of facilities contracts totaling nearly $10,000,000, dredging, grading, filling and pile-driving operations began.

On this teaming acreage 14 shipways, 30 gantries and 10 outfitting

May 24, 1941, U. S. Maritime Commissioner, Captain Howard L. Vickery, removes his goggles after applying the first weld at the laying of Keel No. 1, California Shipbuilding yard

docks are now being built—eleven of the former already completed—providing facilities for working on 24 ships at a time.

Up in six weeks went the $80,000 Administration Building, down at the rate of 600 a day went the first of 50,000 piles—a pile-driving job, by the way, that is one of the largest in the history of American industry, requiring poles enough to string a telephone line from Los Angeles to Chicago!

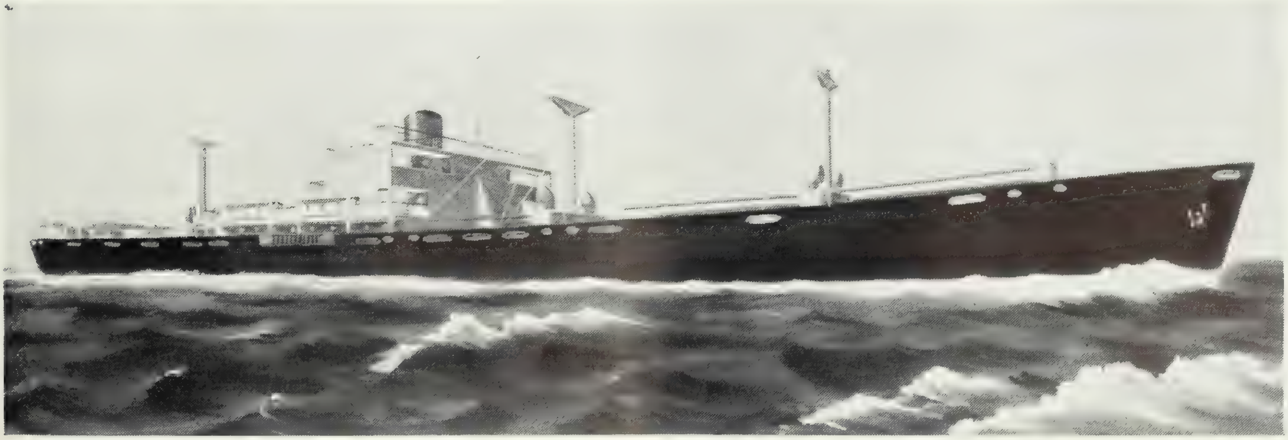
Like mushrooms giant structures began to appear throughout the yard. In April the 115′ x 312′ mold loft was completed. By May the floors of two 350-foot warehouses were laid and framework of the huge plate and structural shop, measuring 225′ x 750′, with a floor area of four acres, was up and already housing equipment. Pipe shop, machine shop, assembly skids and storage areas were under way. Five miles of railroad track were being laid and equal amount of roads were rapidly being constructed.

On May 24, with Maritime Commissioner Howard L. Vickery, Emergency Ship Construction Director J. E. Schmeltzer and R. C. Thompson of the British Purchasing Commission as guests of honor, the first two keels were laid, a month ahead of schedule.

With the first launching scheduled for early October, first delivery approximately two months later, and delivery of the last of the 55 ships now set for several months earlier than the original schedule of March, 1943, these yard facilities just have to be ready. And ready they will be. To date all work is well ahead of schedule.

Employment at "Calship" is expected to reach 3000 in July, and 11,000 within a year. Man hours per ship are estimated at 624,000 not including joiners.

(Page 98, please)



Artist's conception of EC-2 type steamer, 312 of which are on order in American shipyards. 112 of these are for Pacific Coast yards and 55 of the 112 are building at the Terminal Island yard of the California Shipbuilding Corporation

Consolidated Steel
Progress and

The third of the ten ships now under construction at the Consolidated Steel Corporation, Ltd. shipyard in Long Beach was launched at 11 a. m. on Thursday, June 26, 1941.

The Alcoa Steamship Company, Inc., for whom this ship is being constructed by the U. S. Maritime Commission, named her S. S. Alcoa Pennant and Miss Carol Steinle, of Glendale, christened the hull. Miss Steinle is the daughter of F. P. Steinle, of the Aluminum Company of America, Los Angeles.

The Maritime Commission had instructed Consolidated Steel Corporation to simplify the launching ceremonies in view of the great amount of shipbuilding in the various yards in Los Angeles and Long Beach Harbor. Because of the urgent need for hastening construction of these vessels under the National Defense Program, it is necessary that other work in the shipyard not be interrupted, and therefore the invitations were limited to civic officials and guests of the steamship line. Nevertheless a large crowd gathered on the opposite side of the channel to witness the launching.

Miss Carol Steinle christens with gusto; R. Gerhart attends with interest

The Alcoa Pennant is the third ocean going merchant ship constructed in Southern California in many years. Upon completion in October, it is reported that she is scheduled for service between the East Coast and South America, her home port being New York.

This vessel is of the Maritime Commission's C-1 full scantling design, 417′ length overall, with 60′ beam and 37′6″ molded depth, a gross tonnage of about 7500, and a displacement of about 12,900 tons; five cargo holds with a cargo capacity of 8000 tons; accommodations for eight passengers; 4000 hp steam turbine propelled, and a normal sea speed of 14 knots.

The first of the four design C-1 cargo vessels under construction by Consolidated Steel Corporation for the Maritime Commission is the Agwimonte, formerly Cape Mendocino; the second is the Agwiprince, launched on March 27, 1941. The fourth vessel, known as Hull 159, is scheduled to be launched September 10, 1941, and will also be delivered to the Aluminum Company of America. The first two vessels were allocated to The New York and Cuba Mail Steamship Company by the Maritime Commission.

Miss Steinle was accompanied during the launching ceremony by Mr. R. W. Gerhart, manager of Consolidated Steel's Los Angeles Shipbuilding Division.

Prominent guests on the launching platform included the following:

Expansion

Alcoa Pennant proves that in the making of foam, the water of Cerritos Channel is just as potent as the best California champagne. Below: she floats proudly on an even keel

Mr. John J. Dempsey, United States Maritime Commissioner, Washington (recently appointed Under Secretary of the Interior).

Mr. Wm. Holzhauer, Los Angeles manager of the Aluminum Company of America, representing the Alcoa Steamship Company.

Mr. A. G. Roach, executive vice president, Consolidated Steel Corporation, Ltd.

Mr. Fred A. Hooper, American-Hawaiian Steamship Company. President of the Propeller Club of the United States, Port of Los Angeles No. 66.

Mr. Harry J. Summers, principal surveyor of the American Bureau of Shipping.

Capt. R. B. Coffman, USN, assistant commandant, 11th Naval District.

Capt. S. F. Heim, USN, Navy port captain, Los Angeles Harbor.

Capt. H. S. Jeans, USN Ret., supervisor of shipbuilding, U. S. Navy.

Mr. John A. McCone, vice president and general manager of California Shipbuilding Corporation.

Mr. George Sutherland, general manager of Los Angeles Shipbuilding and Dry Dock Company.

Mr. T. B. Forster, general manager of Bethlehem Steel Company, Terminal Island, California.

Mayor Francis H. Gentry, Long Beach, California.

A reception for the sponsor and the officials of the Alcoa Steamship Company and Aluminum Company of America was held at the Pacific Coast Club immediately following the launching ceremony.

Following Hull 159, which will be launched early in September, Consolidated Steel Corporation will start construction of two design P-1 transports, Hulls 206 and 207, also for the U. S. Maritime Commission and scheduled for delivery in 1942. Construction of Hulls 222-225 inclusive, the additional four design C-1 cargo vessels recently awarded by the Commission, will follow the two transports. The contract price of these ten vessels totals approximately 26 million dollars.

The characteristics of the Maritime Commission's C-1 full scantling design ships are as follows: 417′ length overall; 60′ beam, 37′ 6″ molded depth; approximately 7500 gross tons, and a displacement of about 12,900 tons. There are five cargo holds with a total capacity of approximately 8000 tons, and first class accommodations are installed for eight passengers. The engines are 4000 hp, high-pressure steam turbines and give the vessel a normal sea speed of 14 knots.

Consolidated Steel Corporation also has a contract for the construction of 12 destroyers for the Navy Department at its Shipbuilding Division at Orange, Texas. Keels for the first two destroyers, Hulls 194 and 195, were laid on May 14, 1941, and are scheduled for launching in January of next year. Keels for the second two destroyers, Hulls 196 and 197, were laid on June 25, 1941.

Consolidated recently filed an application with the City of Los Angeles, Board of Harbor Commisisoners, to lease a site at the harbor to expand its local shipbuilding activities under the National Defense Program. If this lease is granted the company will construct four additional shipways with contingent outfitting facilities, with room for expansion to a total of eight additional shipways. The establishment of these additional shipbuilding facilities will expand Consolidated's construction program and its shipyard personnel to approximately 4000 workers, which will, in turn, greatly increase the payrolls in the area under the National Defense Program, and will be of considerable benefit to the community. Consolidated Steel originated the reestablishment of shipbuilding in Southern California and is both happy and proud to have the opportunity to construct these vessels now under contract and those additional which may be allocated to it, which form an important part of the nation's defense.

Seamen To Become Officers

Three hundred and fifty American seamen on June 24 were offered an opportunity to become licensed merchant marine officers this year under a new Maritime Commission Educational Training Program.

They would be paid $99.00 a month during a four to six month's course which would fit them to take the usual Government examinations for licenses as Third Mates or Third Assistant Engineers. The present shortage of licensed merchant marine officers virtually assures employment if they pass their tests.

On July 1, the Maritime Commission opened two Officer Training Schools reserved entirely for experienced seamen.

The three qualifications for admission are:

Applicants must not be less than 19 years of age.

Must have been to sea for three years.

Must pass the same physical examination which they will have to pass several months later when they take their license examinations.

The school for those near the Atlantic and Gulf Coasts is at Fort Trumbull, New London, Connecticut. It will accommodate 200 men. The Pacific Coast School at Government Island, Alameda, California, will accommodate 150 men. Both are units of the United States Maritime Service, operated for the Commission by the United States Coast Guard.

Enrollments may be made at any Coast Guard Recruiting Station, any District Office of the Maritime Commission, or directly by mail to the United States Coast Guard, United States Maritime Service, 14th and Maine Avenue, S. W., Washington, D. C. Enrollments will be accepted after July 1 and, if both schools are filled, a waiting list will be established from which men will be appointed as rapidly as vacancies develop.

New Union Oil Tanker Launched

Bethlehem Sparrows Point Yard Puts Over S. S. Paul M. Gregg for Pacific Coast Service

An important addition was made to the rapidly growing fleet of American tankers when the S. S. Paul M. Gregg was launched June 14 at 11 a. m. (E.S.T.), at the Sparrows Point Yard of Bethlehem Steel Company, Shipbuilding Division. The new vessel, the keel of which was laid on December 23, 1940, is being built for Union Oil Company of California and will be used in regular service on the Pacific Coast. Mrs. Charlotte D. Gregg, of Pasadena, California, was the sponsor. Her husband, for whom the vessel is named, was for many years vice president and a member of the executive committee and the board of directors of the Union Oil Company. Mr. Gregg retired from these positions last year.

The Paul M. Gregg has a deadweight of about 13,00 tons and has a tank capacity of 103,445 barrels, or 4,344,690, gallons of oil. The cargo tank space is divided into 24 compartments, allowing many grades of oil to be carried at one time. Pumping capacity is designed to load or unload the vessel in less than 12 hours.

The principal dimensions are as follows: Length overall, 463 feet; molded beam, 64 feet; molded depth, 34 ft. 10 in.; draft, 28 ft. 6 in.; speed, 13 knots.

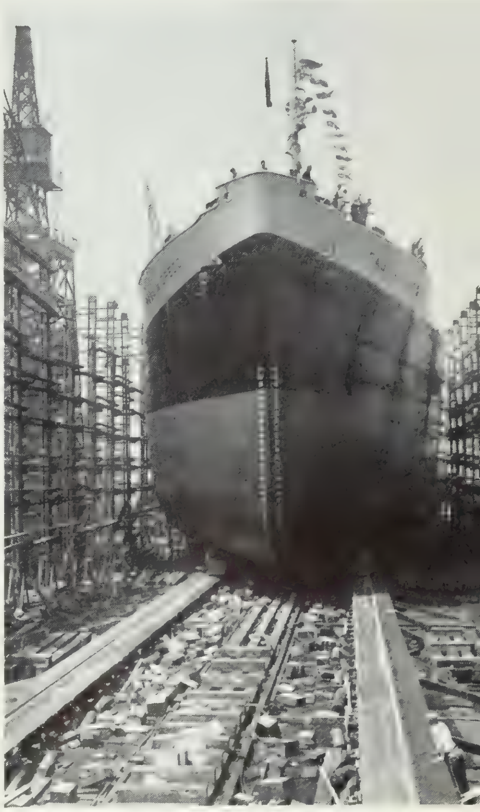
The propelling machinery consists of a single screw installation of Bethlehem-built turbines, developing 3500 shaft horsepower. Steam will be supplied by two water tube oil burning boilers. The ship is fitted with a Contra-rudder to augment the propulsive effect of the screw.

The Paul M. Gregg represents the latest in tanker design. Extensive use of welding and application of the Bethlehem-Frear system to longitudinals and bulkheads insure a light, yet strong framing with a substantial increase in paying deadweight for the given displacement. The vessel is of the conventional tanker appearance, with separate forecastle, midship navigating bridge, and poop, connected by the usual catwalk. Raked stem and cruiser stern give the vessel a pleasing and shipshape appearance.

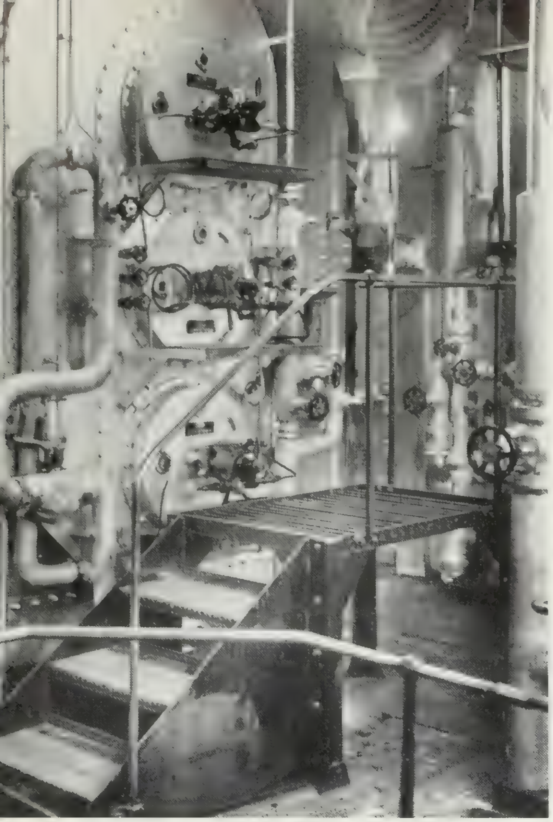
Modern and complete navigation equipment has been installed in the pilot house amidships. This includes complete gyro compass equipment, in addition to the magnetic compasses, and Gyro-Pilot automatic steering control. A Fathometer and an electric sounding machine are also installed, as well as a continuous three-day course recorder. Among interesting safety devices are independent radio receivers, an automatic S.O.S. receiver, radio direction finder and complete radio communication equipment, one set of which has a range of about 2000 miles. Automatic alarms indicate burning out of running lights, failure of oil supply and similar disturbances. An inert gas system of the Union Oil Company's type is fitted for protection of the cargo tanks.

Excellent accommodations are provided for 13 officers and a crew of 30 men. The men are housed in 15 rooms, two men in each, while the officers have individual rooms. Accommodations also include smoking rooms and mess rooms for officers and crew, hospital, laundry, cold storage and provision storage.

As the vessel will operate in warm climates, sufficient ventilation has been provided to insure fifteen complete changes of air hourly in all living quarters and mess rooms. Chilled drinking water is also supplied, an important feature on ships making tropical runs, and the ship has a distillation apparatus which, in emergencies, can produce drinking water from sea water.



The ship is built to the highest class of the American Bureau of Shipping, under their special survey, and in accordance with the latest regulations of the Bureau of Marine Inspection and Navigation, and also meets with the requirements for the Panama and Suez Canals.



Front of one of the Foster Wheeler steam generators with three Todd oil burners

Moore Delivers

Pictures and Some Latest C-3 for Moore—

The Moore Dry Dock Company of San Francisco and Oakland, California has now completed the four C-3 type of cargo vessels which were allotted to them by the U. S. Maritime Commission on competitive bidding. The propulsion machinery of each of the four ships has performed with better than guaranteed efficiency on trials. Competent critics pronounced the hulls to be beautiful examples of the shipfitters art.

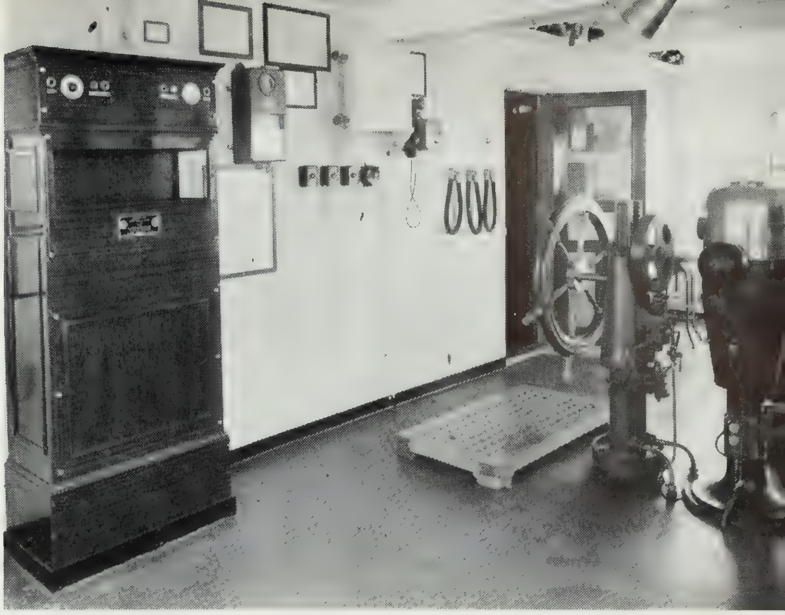
The first of the four ships was delivered to the Maritime Commission and immediately taken over by the U. S. Navy Department which turned her over to her builders for conversion into a fleet repair vessel. Originally christened Sea Arrow, her name was changed to Tangier by the Navy. She was followed by the Mormacstar, the Mormacsea, and now the Mormacsun, all delivered to the Moore-McCormack Lines, Inc.

The general characteristics of the vessels were described in great detail in the July, 1940 issue of Pacific Marine Review. This article is largely for the purpose of presenting a group of very fine photographs of the machinery installation and of a few of the auxiliaries. These photographs were made by Gabriel Moulin Photographic Studios of San Francisco on the ship after her standardization trials.

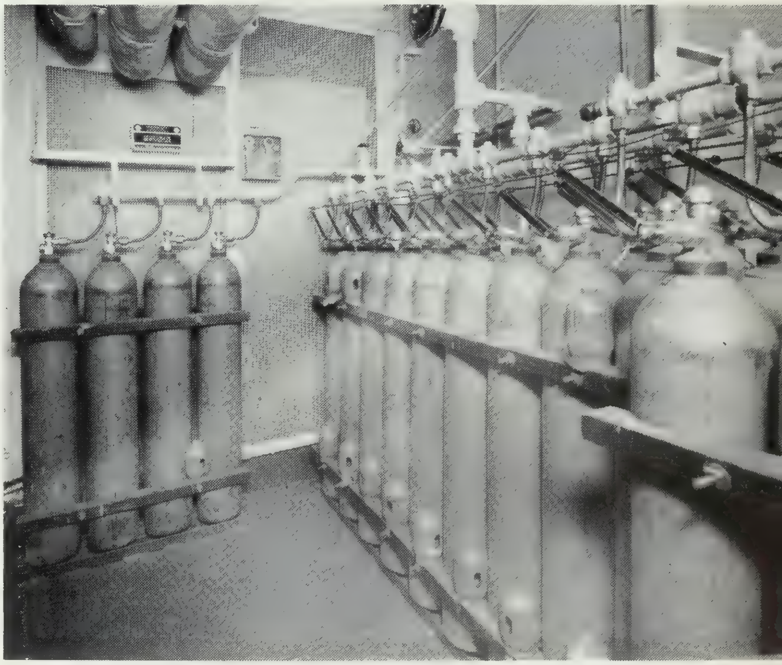
Mormacsun on trials in San Francisco Bay

Mormacsun

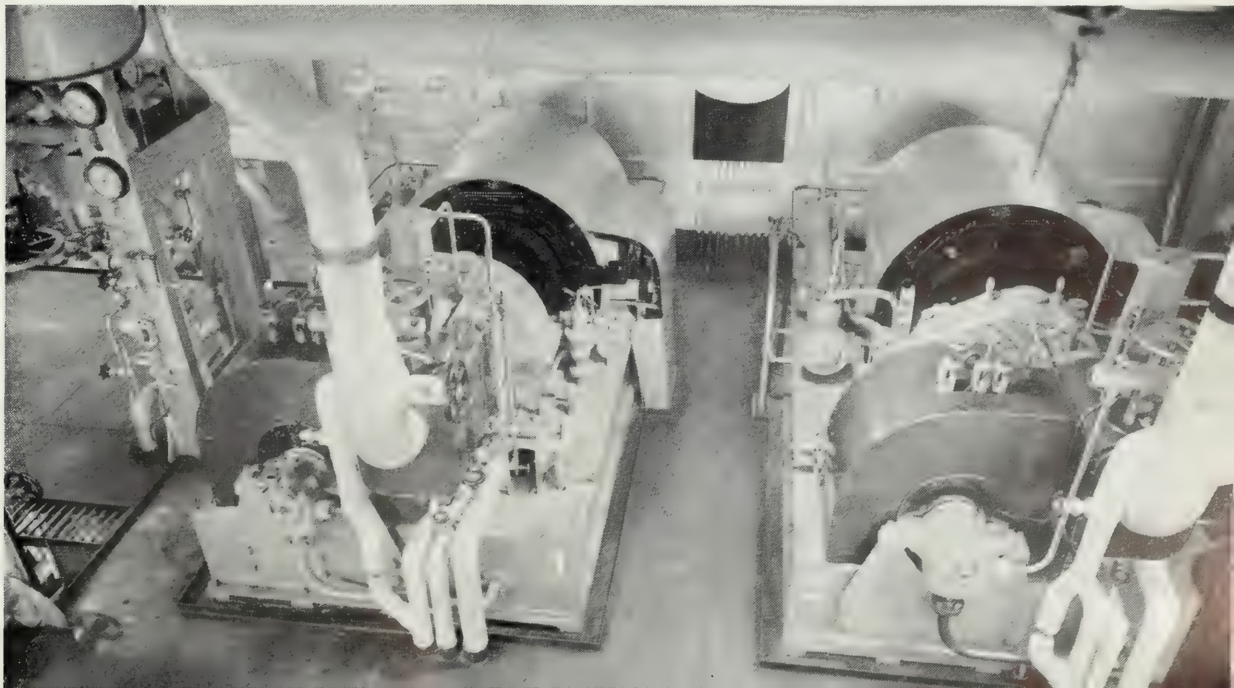
Comment on McCormack Lines



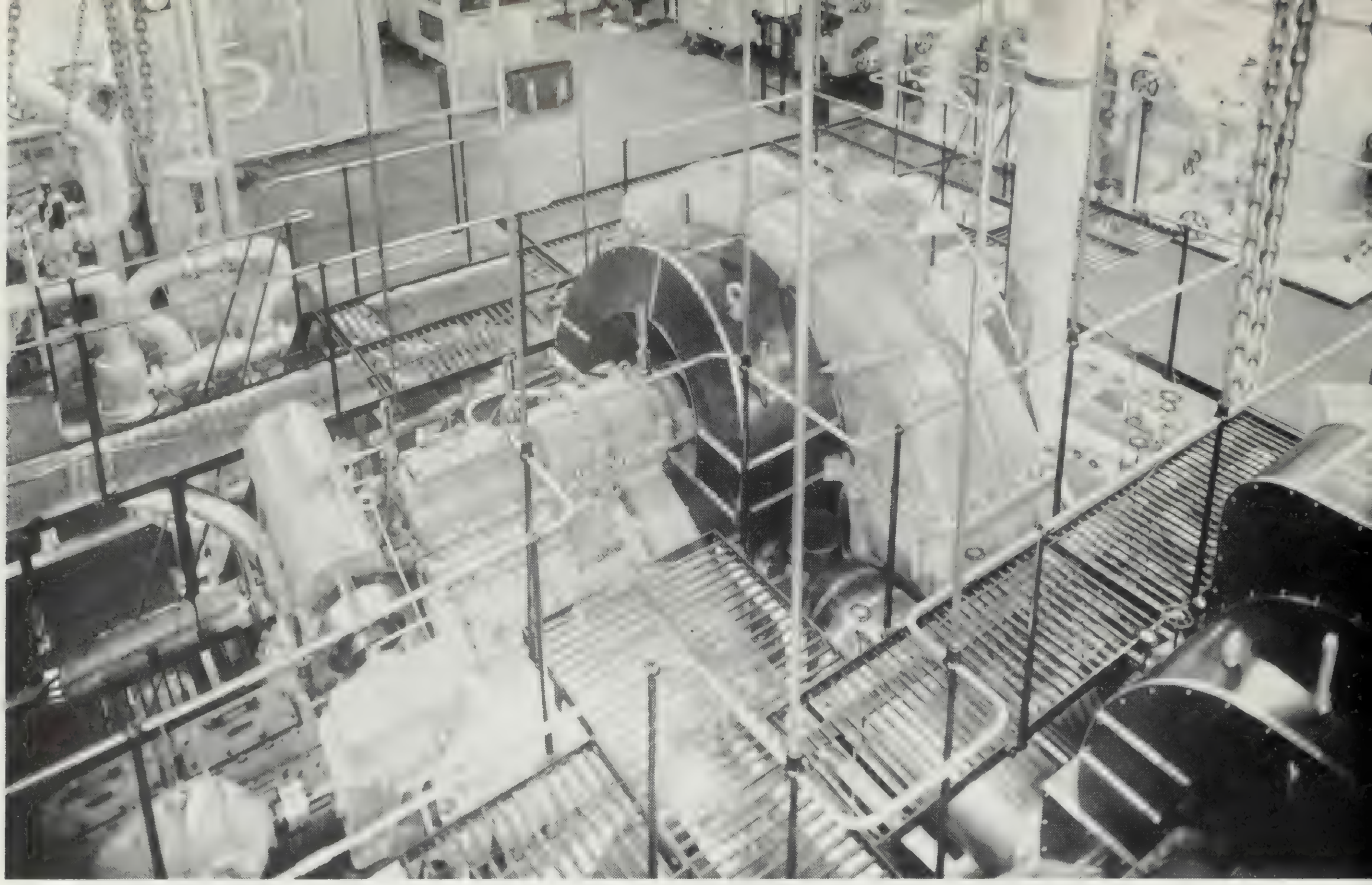
Top: Pilot house, featuring Lux-Rich-audio smoke detection cabinet



Center: Batteries of Lux CO_2 cylinders, supplied by Walter Kidde & Co.

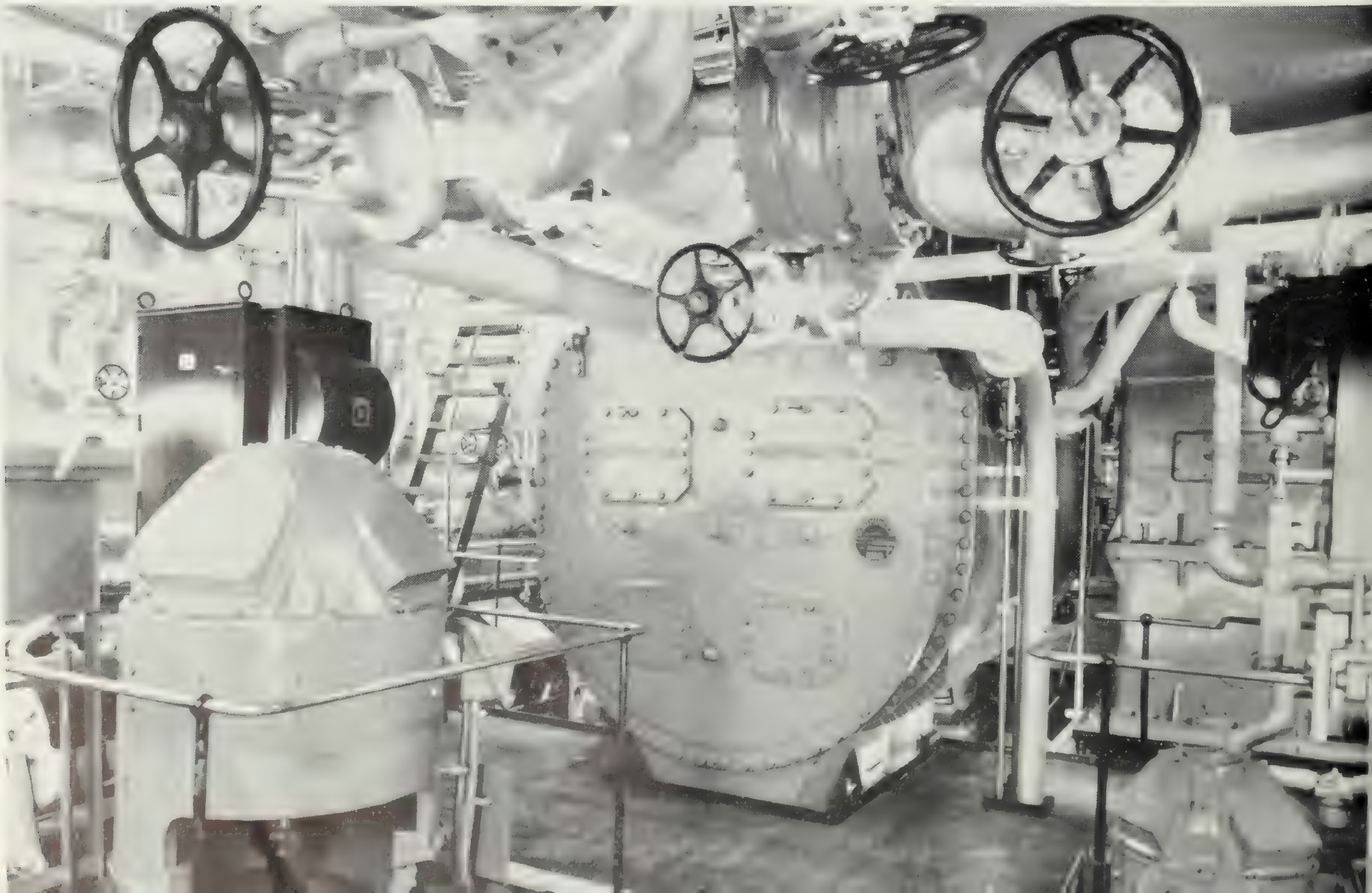


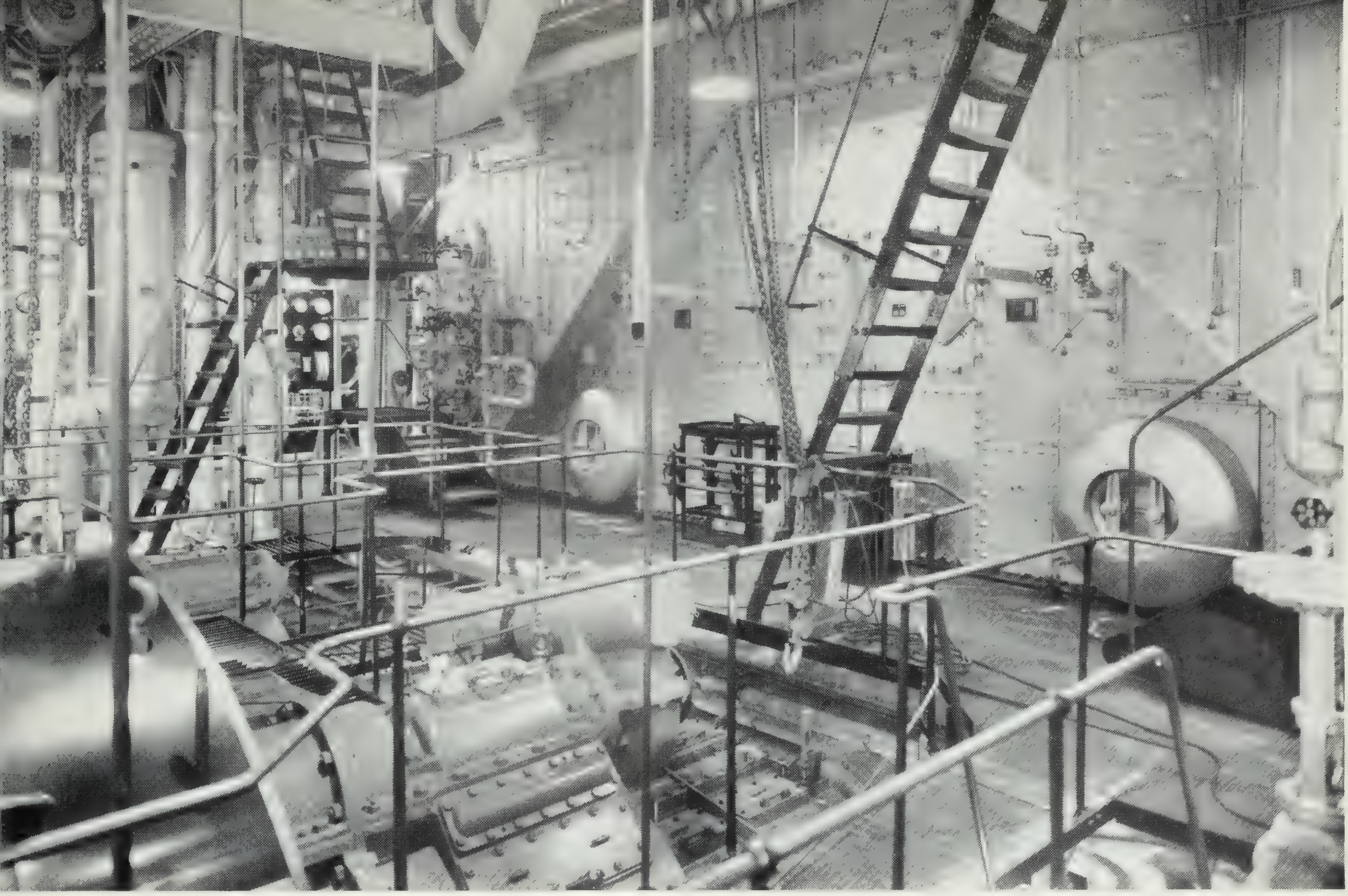
Bottom: The two De Laval-Crocker Wheeler turbo generator sets supply electric power for the ship



Looking down on the working platform of the engine room S. S. Mormacsun, featuring De Laval main propulsion unit, an 8500 shp cross compound, double reduction geared turbine ↑

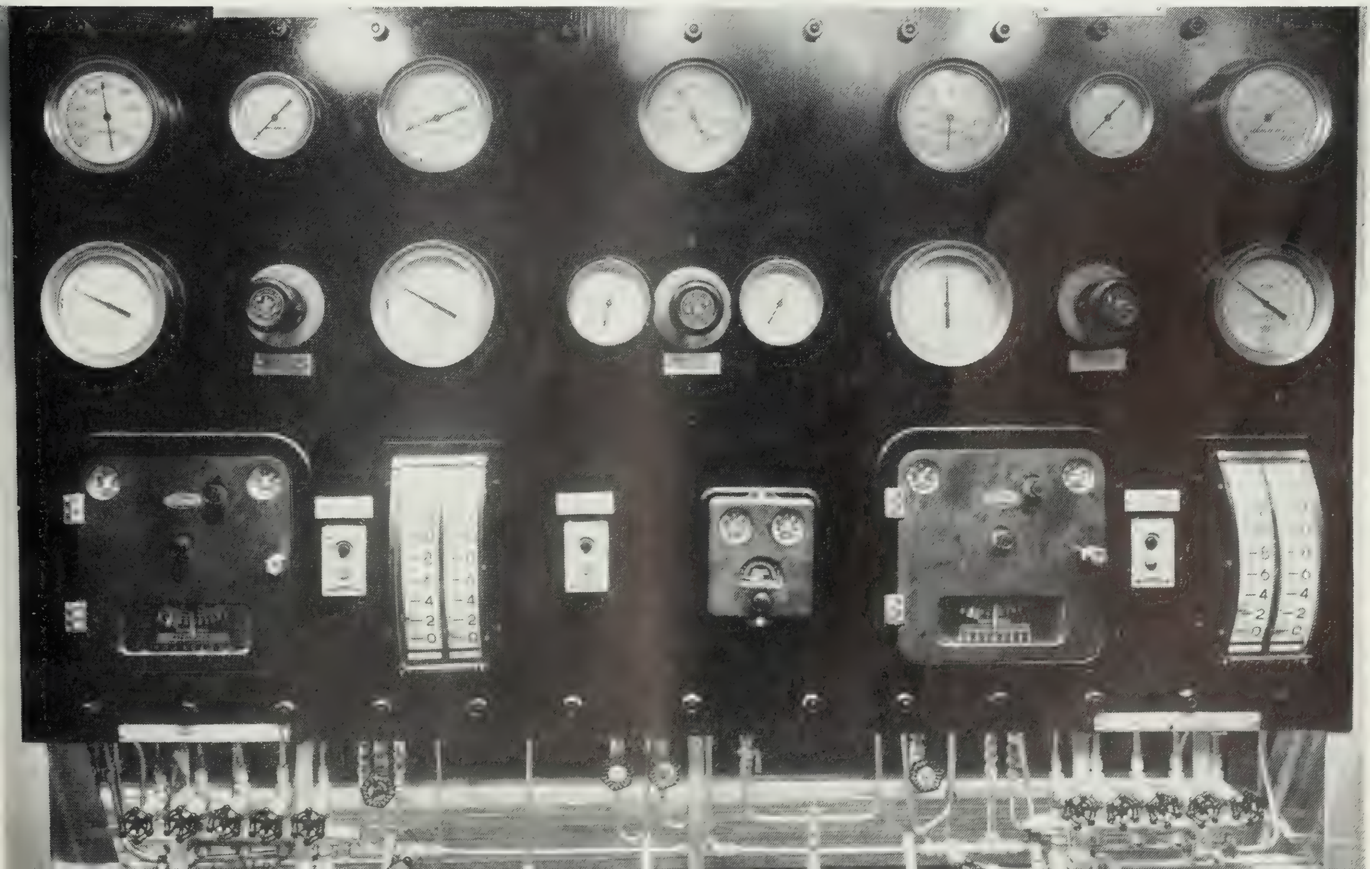
On the lower grating of the engine room, showing the Worthington condenser, pumps and piping. ↓



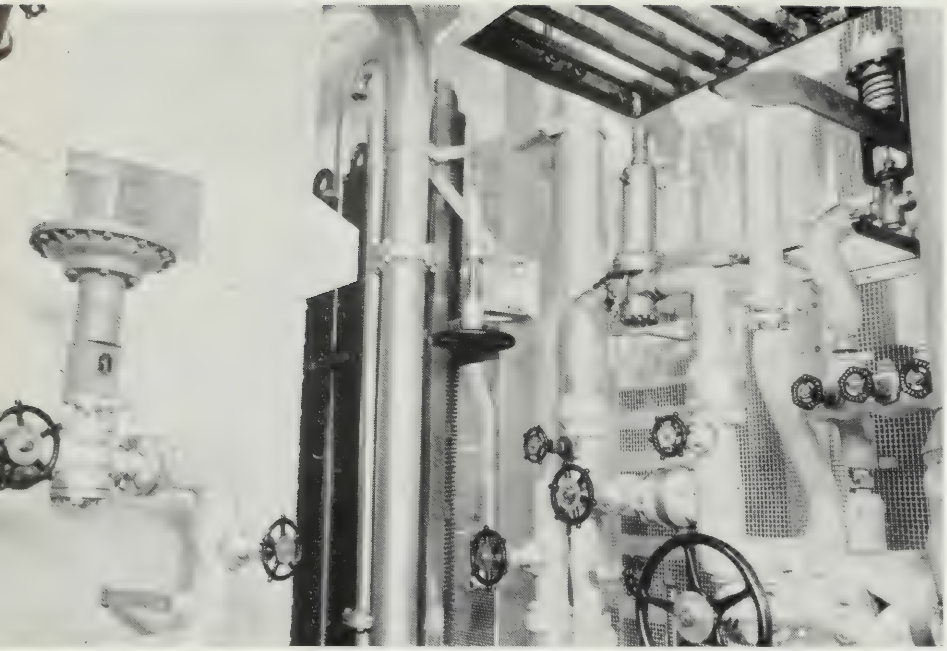


↑ *Picture taken on the working platform of engine room looking aft at the furnace front of the two Foster Wheeler steam generators*

↓ *Close-up of the Masoneilan combustion control board that automatically takes care of combustion problems for these boilers*



mechanical gearing which reduces the propeller shaft speed to 85 rpm.

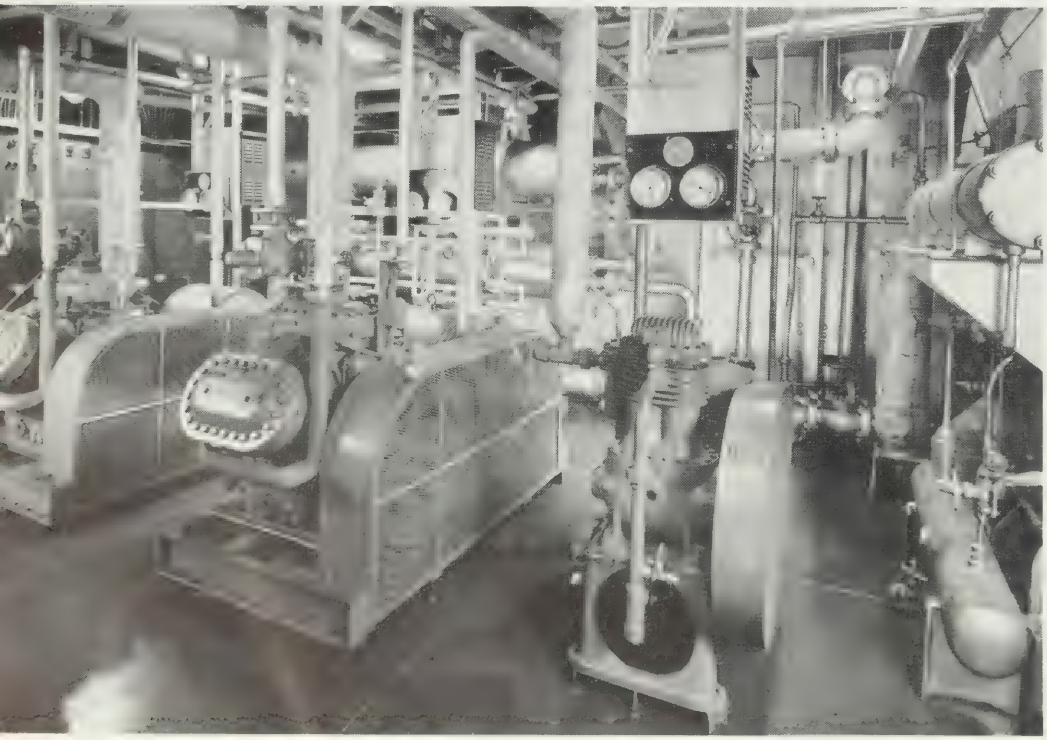


A corner of one of the steam generators, featuring: one of the Masoneilan differential-pressure valves that control combustion; and some of the piping

The steam from the low-pressure turbine exhausts directly into a Worthington condenser which easily maintains a vacuum of 28½ inches. This condenser is served by Worthington centrifugal circulating and condensate pumps and by a Worthington air ejector.

The condensate pump takes the condensed steam from the bottom of the condenser at a temperature of 92° F. and forces it through three stages of heating. First, it acts as a cooling medium for the higher stage feedwater heater drainage and is raised from 92° to 98.3° F. Second, it goes through a Davis "Paracoil" heater using steam bled from the turbine at 8 pounds pressure which raises the temperature from 98.3° to 168° F. Third, it goes to a Worthington deaerating heater, which removes all of the entrained air and also raises the condensate to 240° F. using bled steam at 25 psi. This Worthington heater is installed high up in the engine room and has a surge capacity of 645 gallons. It forms a closed hot well and a positive head on the suction of the main feed pumps. This feed pump is a Worthington 4.5″ by 8″ triplex single-acting plunger type driven through mechanical gearing by a 75 bhp Westinghouse electric

All self-propelled ships derive their energy from heat. In this group of ships, heat is derived from the combustion of oil burned in the water-walled furnaces of Foster Wheeler steam generators. This heat is transmitted through the walls of tubes to the water in those tubes, thereby generating steam at a pressure of 450 psi and a temperature of 750° F. This steam is piped to the nozzles of a De Laval turbine and drives the high-pressure rotors of that turbine at 5012 rpm and the low-pressure rotor at 3459 rpm. Such speeds are far too high for efficient propeller design, and, yet, lower speeds would cut down the efficiency of the steam expansion in the turbine. So, the turbine rotors are connected to the propeller shaft through double



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The refrigeration requirements of Mormacsun are supplied by these York Freon-12 compressors and condensers, a thoroughly modern plant automatically controlled to hold the cargo spaces at the predetermined temperature

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motor. It forces the feed water through a Davis heater that raises its temperature to 310″ F. and thence through the economizer tubes in the boiler uptakes, to the water drum of the boiler. When everything is going right the temperature of the gases in the stack will be reduced to 275° F.

The steam generators are fitted with Todd Variable Capacity oil burners. These burners are provided with air for forced draft combustion by motor-driven Sturtevant blowers which drive the air through the tubes of the preheaters, and through casings down the back, under the bottom and up the front of the boilers to the three burners. This arrangement together with the heavy insulation and water tube walls of the furnace combines to make a very cool and comfortable engine room and achieves all the benefits of forced draft without the inconvenience of the "closed stoke hold."

Combustion is automatically adjusted by a Masoneilan control which manages the forced draft blowers, the oil supply and the feed pump through differential pressure valves.

Practically all of the engine room auxiliaries and all of the deck machinery are electric drive. This together with the lighting and cooking loads makes a high electrical power requirement. To meet this there are two 300 kw, 120-240 volt steam turbo generator sets installed on a flat at one side of the engine room. The turbines are De Laval, taking steam on the same throttle terms as the main propulsion units, i. e. 440 psi and 740° F. and exhausting into a Worthington auxiliary condenser at 28½ inches vacuum. The generators are Crocker Wheeler three-wire compound wound, direct current machines. Electric energy from these dynamos is distributed to the various lighting, cooking and power circuits through a modern dead front switchboard manufactured by the I. T. E. Circuit Breaker Co.

Refrigerated cargo spaces are served by the latest York Freon-12 machines, installed on the 'tween deck space just forward of the engine room casing, an individual refrigerating unit for each cargo compartment.

Safety Equipment

As our pictures show, the Mormacsun has complete fire detection and fire extinguishing equipment of the latest type. The Lux-Richaudio smoke detection cabinet in the pilot house indicates to the officer on watch, both audibly and visibly, the presence of smoke in any of the principal compartments of the ship. This officer can immediately smother any fire in the

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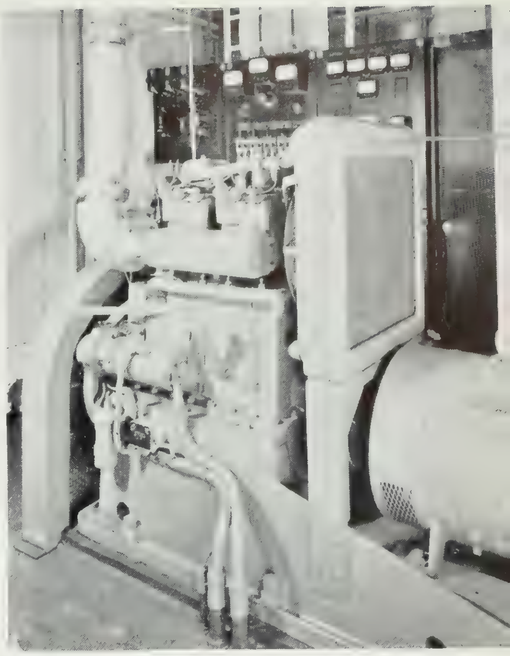
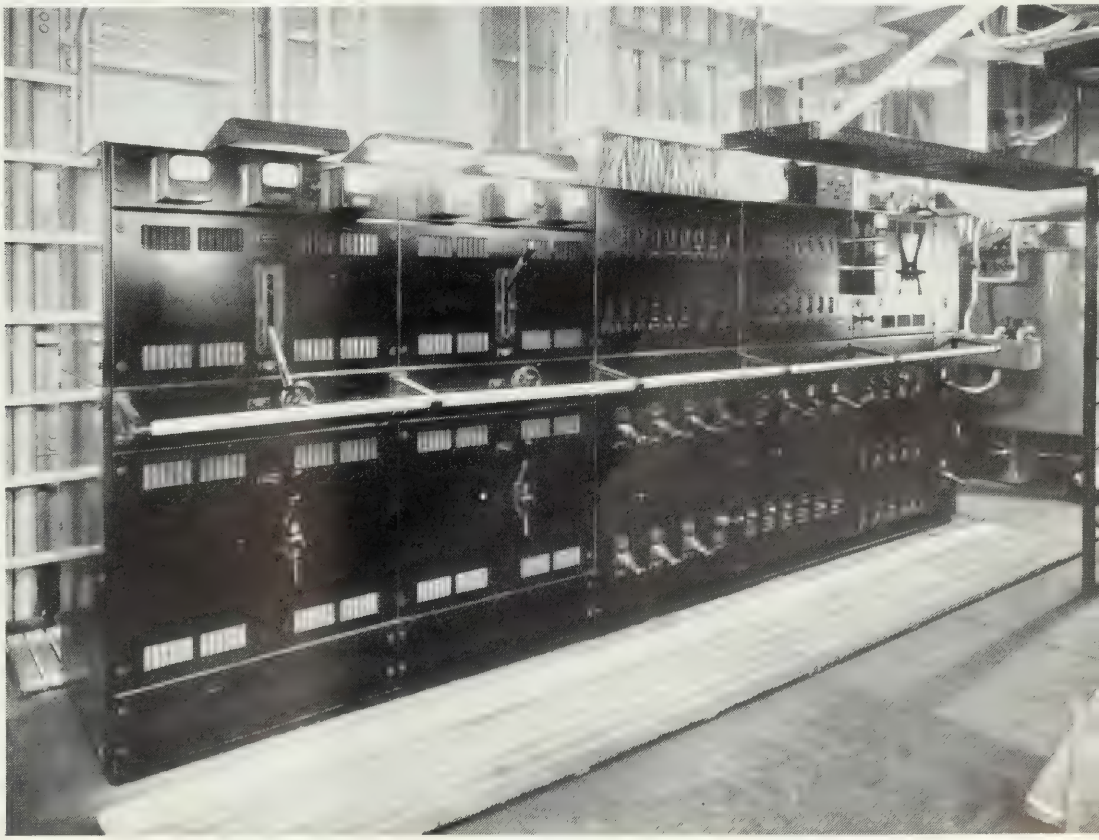


This Hill diesel engine, driving a 7½-kw Electric Dynamic generator, provides energy



This handsome switchboard, supplied by the I. T. E. Circuit Breaker Co., controls all of the auxiliary power, lighting and heating circuits for distribution of electric energy on Mormacsun.

American

The Maritime Commission

of Coastwise, Intercoastal

Maritime Commission Assumes Full Control

The United States Maritime Commission on June 5, announced that Section 37 of the Shipping Act of 1916 as amended is in effect under the proclamation by the President of the existence of an unlimited national emergency. This section prohibits transfer of any interest in a vessel or a shipbuilding plant to foreign ownership, and other action related to shipping without prior Maritime Commission approval. Section 37, in full, follows:

"That when the United States is at war or during any national emergency, the existence of which is declared by proclamation of the President, it shall be unlawful, without first obtaining the approval of the board [Maritime Commission].

"(a) To transfer to or place under any foreign registry or flag any vessel owned in whole or in part by any person a citizen of the United States or by corporation organized under the laws of the United States, or of any State, Territory, District, or possession thereof; or

"(b) To sell, mortgage, lease, charter, deliver, or in any manner transfer, or agree to sell, mortgage, lease, charter, deliver or in any manner transfer to any person not a citizen of the United States, (1) any such vessel or any interest therein, or (2) any vessel documented under the laws of the United States, or any interest therein, or (3) any shipyard, dry dock, shipbuilding or ship-repairing plant or facilities, or any interest therein; or

"(c) To enter into any contract, agreement, or understanding to construct a vessel within the United States for or to be delivered to any person not a citizen of the United States, without expressly stipulating that such construction shall not begin until after the war or emergency proclaimed by the President has ended; or

"(d) To make any agreement or effect any understanding whereby there is vested in or for the benefit of any person not a citizen of the United States, the controlling interest or a majority of the voting power in a corporation which is organized under the laws of the United States, or of any State, Territory, District, or possession thereof, and which owns any vessel, shipyard, dry dock, or shipbuilding or ship-repairing plant or facilities; or

"(e) To cause or procure any vessel constructed in whole or in part within the United States, which has never cleared for any foreign port, to depart from a port of the United States before it has been documented under the laws of the United States.

"Whoever violates, or attempts or conspires to violate, any of the provisions of this section shall be guilty of a misdemeanor, punishable by a fine of not more than $5,000 or by imprisonment for not more than five years, or both.

"Any vessel, shipyard, dry dock, shipbuilding or ship-repairing plant or facilities, or interest therein, sold, mortgaged, leased, chartered, delivered, transferred, or documented, or agreed to be sold, mortgaged, leased, chartered, delivered, transferred, or documented, in violation of any of the provisions of this section, and any stocks, bonds, or other securities sold or transferred, or agreed to be sold or transferred, in violation of any of such provisions, or any vessel departing in violation of the provisions of subdivision (e), shall be forfeited to the United States.

"Any such sale, mortgage, lease, charter, delivery, transfer, documentation, or agreement therefor shall be void, whether made within or without the United States, and any consideration paid therefor or deposited in connection therewith shall be recoverable at the suit of the person who has paid or deposited the same or of his successors or assigns, after the tender of such vessel, shipyard, dry dock, shipbuilding or ship-repairing plant or facilities, or interest therein, or of such stocks, bonds, or other securities, to the person entitled thereto, or after forfeiture thereof to the United States, unless the person to whom the consideration was paid, or in whose interest it was deposited, entered into the transaction in the honest belief that the person who paid or deposited such consideration was a citizen of the United States."

The foregoing section was added to the Shipping Act, 1916, by section 4 of the act of 1918.

Shipping Trends

Now in Complete Control

nd Overseas Shipping

Acquisition of Ships For Emergency

The Maritime Commission on June 4 announced that its Division of Emergency Shipping has negotiated the acquisition of 28 merchant vessels, 21 of which are to be turned over to the Navy and seven to the Army.

The vessels are named in table herewith.

The Maritime Commission's Division of Emergency Shipping has arranged with the British Supply Council for North America for all British shipping services from Canada and the United States to Australia and New Zealand to be handled by United States flag vessels.

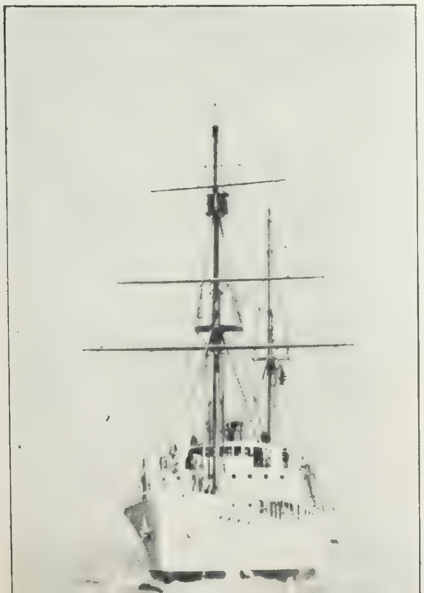
This will release a dozen British vessels for Great Britain's own war effort.

For the Navy

Name	*Type*	*Line*
America	Passenger-Cargo	United States Lines Co.
Washington	Passenger-Cargo	United States Lines Co.
Manhattan	Passenger-Cargo	United States Lines Co.
Robin Kettering	Cargo	Seas Shipping Co., Inc.
Mormacdove	C-2 Cargo	Moore-McCormack Lines, Inc.
Mormacpenn	C-3 Cargo	Moore-McCormack Lines, Inc.
Mormacgull	C-2 Cargo	Moore-McCormack Lines, Inc.
Mormacwren	C-2 Cargo	Moore-McCormack Lines, Inc.
Mormaclark	C-2 Cargo	Moore-McCormack Lines, Inc.
Mormactern	C-2 Cargo	Moore-McCormack Lines, Inc.
Executor	Cargo (Export)	American Export Lines, Inc.
Exporter	Cargo (Export)	American Export Lines, Inc.
Doctor Lykes	C-3 Cargo	Lykes Bros. Steamship Co., Inc.
Hawaiian Packer	Cargo	Matson Navigation Co.
President Jackson	C-3 Passenger & Cargo	American President Lines
President Adams	C-3 Passenger & Cargo	American President Lines
Delorleans	Passenger-Cargo	Mississippi Shipping Co., Inc.
Panama	Passenger-Cargo	Panama R. R. Co.
Santa Teresa	C-2 Cargo	Grace Line, Inc.
Chiriqui	Passenger-Cargo	United Fruit Co.
Quirigua	Passenger-Cargo	United Fruit Co.

For the Army

President Hayes	C-3 Passenger & Cargo	American President Lines
President Pierce	Passenger-Cargo	American President Lines
President Taft	Passenger-Cargo	American President Lines
President Cleveland	Passenger-Cargo	American President Lines
President Coolidge	Passenger-Cargo	American President Lines
Deltargentino	Passenger-Cargo	Mississippi Shipping Co.
Oriente	Passenger-Cargo	N. Y. & Cuba Mail S. S. Co.



Foreign Vessels Requisitioned

On June 6 the President signed the ship requisition bill and issued an executive order placing laid-up foreign vessels in the jurisdiction of the Maritime Commission. The Emergency Shipping Division of the Commission immediately announced that, "The Commission is prepared to take over the ships and allocate them to services which will be the most useful in the interest of national defense."

Vessels of foreign registry laid up in United States ports, and subject to the terms of the ship requisitioning law are as follows:

	Number	*Gross Tons*
Danish	39	140,871
German	2	8,999
Italian	28	168,744
Estonian	2	3,837
French	11	131,939
Lithuanian	1	1,255
Rumanian	1	3,495
Total	84	459,140

No American Tankers Serving Axis Powers

The Maritime Commission June 14 announced that a current check of its records shows that American owned or controlled tankers are not carrying oil directly or indirectly to Germany, Italy or Japan.

No owned or controlled tankers under American registry have engaged in trade to those countries since the outbreak of the war. A check of American owned or controlled tankers under foreign registry shows that none is currently engaged in such a way or has been for the last six months, with the exception noted below.

This record excepts the activities of five tankers registered under the German flag and five registered under the Italian flag. Owners of these tankers have been unable to exercise control over their movements during the last year and one-half and have no authentic reports on their activities. A solitary ship under another foreign registry is completing a voyage to Japan under a contract arranged some time ago. Upon completion of this voyage the vessel will be required for other trades.

American owned or controlled tankers under all foreign registries have been and are now engaged in Western Hemisphere trades, trades to the United Kingdom and to the Dutch East Indies. This particularly applies to tankers which were at one time under American registry and were transferred to Panamanian registry. As will be seen from the table herewith the largest single group of such tankers are under British registry and are chiefly engaged in United Kingdom services:

Foreign Flag Tankers Owned or Controlled by American Companies, as of May 1, 1941

	No. of Vessels	*Gross Tonnage*
Argentine	5	11,362
Belgium	1	5,322
Great Britain	88	547,513
Cuban	1	1,983
Danish	1	1,099
French	6	37,816
German	5	49,591
Honduran	1	7,623
Italian	5	35,835
Netherlands	7	39,539
Norwegian	12	96,414
Panamanian	60	498,398
Venezuelan	22	62,617
Total	214	1,395,112

The Commission is cooperating closely with Coordinator of Petroleum for National Defense Harold F. Ickes, and the Commission's control over transportation will be exerted in the interests of Inter-American trade, National Defense and aid to the democracies.

Service and Information

A Centralized Office for Business Contacts With Every Federal Bureau and Department

Approximately 2500 Government purchasing agencies purchase some 300,000 different articles. Indeed, the Government buys some quantities of almost everything produced in this country.

The magnitude of the Government purchasing set-up, especially in this emergency when first emphasis is necessarily placed upon defense equipment for the expanding Army and Navy and for Great Britain, tends to confuse many manufacturers who desire to cooperate 100 per cent.

Actually, Government purchases are made on a very simple formula. The specifications are not complicated. In fact, the biggest buyer in the world—Uncle Sam—has the simplest system of purchasing supplies, equipment and services. The system functions something like a large mail order house, except that where the latter sells to thousands, the Government buys from thousands.

How can a business man sell to the Government?

The initial venture of selling to the Government will, of course, present some new problems. None of these problems, however, are necessarily complicated. In order to help manufacturers solve them, Jesse Jones, Secretary of Commerce, early in his administration set up a Service and Information Office, staffed with men who have had years of service in Government and have recently completed months of intensive study of the purchase systems of each governmental office.

Consequently, the Service and Information Office is equipped to inform manufacturers whom they should contact and exactly how to do so. A manufacturer who desires to cooperate with the Government in the present emergency, and lacks specific information as to how to proceed, is invited to apply to this unit, room 1060, Department of Commerce, Washington, D.C. The effectiveness of the assistance rendered by the Office is demonstrated by the large number of telegrams and letters of appreciation which it has received.

Many manufacturers apparently have felt that if they desire to transact business with the Government they must either come to Washington in person or employ somebody familiar with Government purchasing methods.

The Service and Information Office strongly urges manufacturers not to come to Washington, at least until they have carried on preliminary negotiations by mail with the purchasing agency that handles their particular products.

They are advised not to employ outsiders on a commission or other basis. In fact, the War and Navy Departments and the Office of Production Management have repeatedly warned against the employment of what are termed "lobbyists" in the effort to obtain Government contracts.

Furthermore, the Army, for example, has decentralized its purchasing system. Different depots specialize in purchasing specific supplies. Clothing is purchased in Philadelphia; shoes in Boston; various kinds of equipment in Jeffersonville, Ind.; aircraft supplies in Dayton, Ohio. A very small percentage of Army supplies is purchased in Washington.

The Navy, too, has part of its purchasing system decentralized and prefers to have preliminary negotiations conducted by mail. The Bureau of Supplies and Accounts purchases a major proportion of Navy supplies, aside from contracting for ships.

A third large purchasing agency of the Government is the Procurement Office of the Treasury Department, a centralized purchasing agency for all departments except the Army and Navy. The Procurement Office also has branches in different parts of the country and prefers that preliminary negotiations be conducted by mail.

When it is necessary to come to Washington, the Service and Information Office will gladly arrange for the business man to see the particular official with whom contact should be made. In this way the business man will be able to get in and out of Washington with a minimum of time, effort and expense and return home with a clear understanding of the Government's needs and the necessary procedure in helping to supply them. Generally, by following this suggested approach, the business of the prospective contractor can be transacted in Washington within one or two days.

Correct the Cargo Convoy Management

In a recent speech, Admiral Land, chairman of the U. S. Maritime Commission, after outlining the American emergency shipbuilding effort, makes some very pertinent suggestions on how to conduct convoys. Says he:

In connection with shipping aid to Britain, losses are now occurring at a rate close to five million tons a year. It is obvious that large as the British merchant marine was before the war, it cannot long withstand such losses, especially when millions of tons of its shipping have been necessarily diverted to essential military uses and millions more must be constantly under repair as a result of belligerent action. British merchant marine production before the war was around one and one-half million tons a year, and it is doubtful if, in spite of increased effort, war conditions in her shipyards have permitted of sufficient expansion to improve these figures greatly.

The program which I have outlined, I believe, will produce in this country, when it gets into full swing, from three and one-half to four million deadweight tons a year. This may be insufficient to meet the full extent of British losses, but it is all that can be done effectively without serious changes in priorities.

The Submarine

In considering the demand for ships and more ships, it seems to me we should stop to consider the cause for the demand. In the field of shipping aid to Britain, there is a huge bonfire burning—the submarine menace. If we base our shipping aid to Britain solely on supplying her with more and more ships, we are merely adding more fuel to the fire. Are there not a number of ways of solving this problem by attempting to put out the fire?

The best way to lick the submarine menace is to get it at the source; that is, to bomb the enemy shipbuilding plants. The next best is probably to bomb the repair and rest stations where the submarines go when not at sea. Other ameliorating influences would be:

One; a greater number of British combatant ships in the convoy.

Two; British combatant vessels convoying ships farther out on their outbound voyages.

Three; more British combatant ships meeting convoys at greater distances out on their incoming voyages.

Four; use of convoys for slow ships only. Under present conditions fast merchant ships appear to have as good a chance if not better out of the convoy than in it.

Five; destroy the communications between German aircraft and German submarines by destroying the German air patrol.

Six; utilize an air patrol in the convoy.

There can be no question but that we all want to give the greatest and most effective assistance possible to the British, but we might well ask ourselves in our all-out aid to Britain if we could not give greater help by aiding the British to put out the fire rather than by concentrating most of our efforts on feeding it with fuel.

A Cadet Wins Scholastic Award

For the second consecutive year, Engineer Cadet Joseph Stein, First Class, of 733 Iona Avenue, Akron, Ohio, has won a scholastic award as a result of high marks received in his annual examination, it was announced on June 3 by the Maritime Commission. His average grade for the first year was 88.3 per cent and for the second year, 89.95 per cent. Subjects and grades for his second year examination were as follows:

Ship Construction	84%
Steam Engineering II	84
Metallurgical Processes	85
Chemistry	91
Mechanics	83.5
Mechanical Drawing II	90
Electrical Engineering II	98
Refrigeration	93
Diesel Engineering II	98
Machine Shop II	93
Average	89.95%

Cadet Stein studied engineering at the University of Akron after having been graduated from the Kenmore High School, Akron, Ohio, in 1934. He was appointed a Maritime Commission cadet on April 19, 1939, and had served continuously since that date aboard the Mexico, Comet and Oriente, all of the New York and Cuba Mail S. S. Co. He will complete his training about April, 1942, and will then take his place among the ranks of marine engineers serving aboard United States merchant vessels.

America's Total Shipbuilding Program

by J. E. Schmeltzer

Director Emergency Ship Construction Division United States Maritime Commission

When the United States Maritime Commisison was established in 1937, its first task was the rehabilitation and reestablishment of the once-great American merchant marine. Study of the situation resulted in the decision that the proper program to follow would be the construction of 500 modern, efficient and high-speed ships, during a 10-year period, to replace the fast-aging and nearly obsolete bottoms that were carrying cargoes under the American flag. Most certainly, it was felt, a new ship a week would be ample to meet our current needs and, so far as we could see, those of the future. That plan is termed the long-range program.

But the first of these new vessels barely had begun to come off the ways when nation after nation was enveloped in war—a titanic struggle between totalitarianism and democracy. I need not recount the details of that—all of us know them far too vividly. It suffices to say that the new type of warfare in the air and under the sea began to take an enormous toll of ships—a toll so great that replacement became the most momentous problem the conflict had created.

Almost overnight there was imposed on the Maritime Commission the dual problem of providing water transportation for a major portion of world commerce and to replace, without loss of a precious moment, the great volume of tonnage that was being sent to the bottom of the seas.

In the United States in 1936, there were but 10 shipyards in some degree of activity, with a total of 46 ways large enough for the construction of 400-foot ships, and a large proportion of these active ways was being used for naval construction. Because of the increased activity created by the Commission's long-range program, the number of yards building merchant ships had grown by January of this year to 18 with a total of 70 ways. In these, however, there was some navy construction.

That was the shipbuilding capacity of the nation when the President's order for the 200 emergency cargo vessels was handed to the Commission, with the urgent demand for speed—more speed—and still more speed!

Hardly had negotiations been completed for the construction of seven new shipyards, with 51 ways, to build the 200 EC-2 vessels—dubbed by some the ugly ducklings, but given the significant name of Liberty ships by the Commission—and the contracts awarded for the ships, themselves, when the President, on April 4, under the terms of the Lease-Lend Act, authorized the Commission to build 222 more merchant ships. Of these 112 are to be of the EC-2 type, making a total of 312 emergency cargo carriers that must be off the ways and in service by the end of 1943.

Primarily we had to avail ourselves of the existing supply of "shipyard brains"—of managing and supervisory personnel. We turned, therefore, to established shipbuilding firms to construct the new yards and the emergency ships, the yards to be constructed with funds provided by the Maritime Commission. It was necessary, in order to build the additional 112 emergency ships, to increase the number of new yards from seven to nine and to provide for a total of 79 ways in those yards. All of them are being built. Half of them already are building ships. The first keel was laid on April 30 and, to date, there have been eleven hulls started, the first keel laying coming about a month and a half after the contracts for the ships were signed.

One factor that had to be considered carefully in establishing these new yards was to place them advantageously with regard to labor supply—not close enough to each other to cause conflict in that respect. As a result they have been located at Baltimore, Md.; Wilmington, N. C.; Mobile, Ala.; New Orleans, La.; Houston, Texas; Wilmington, Calif.; Richmond, Calif.; Portland, Ore.; and South Portland, Maine. This distribution throughout the nation permits us to tap equipment production sources in virtually all of the country's industrial centers as well as to be able to utilize some plant facilities in the more isolated sections.

The Emergency Ship

These 312 ships are single-screw cargo vessels, each powered with one three-cylinder, direct acting, surface condensing, triple expansion marine engine of about 2500 ihp at 76 rpm. This engine has cylinder bores of 24½ inches, 37 inches and 70 inches, and a 48-inch stroke. Steam is to be supplied by two water tube boilers at 220 pounds per square inch gage pressure and 450° F. total temperature at the superheat outlet.

Why did the Maritime Commission revert to steam reciprocating engines for the propulsion of these new ships? Because it was apparent this was the only way the job could be done—*on time*.

For the same reason—that of ability to obtain them more quickly—we have gone back in these emergency ships to the installation of steam auxiliaries such as pumps, winches, steering engines, etc., instead of using the more modern—but hard to get—electric-driven auxiliaries.

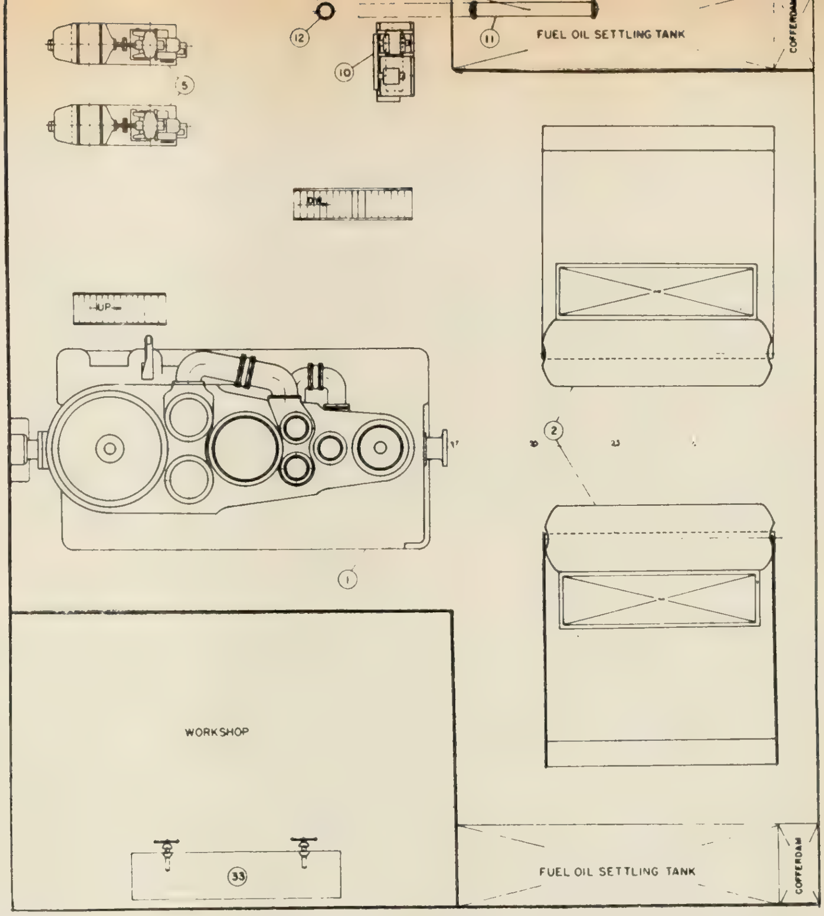
The emergency ship construction program, of course, involves unusually large quantities of everything that goes into them. For instance, we have ordered 624 boilers, 312 main condensers, 3120 deck winches, 312 steering engines, 312 windlasses, 936 twenty kw electric generators, 312 main circulating pumps of centrifugal type, 2808 independent steam-driven pumps and 312 small electric-driven pumps. In addition, there are 312 main air pumps, 624 bilge pumps and 312 evaporator feed pumps, all driven by the main engine.

Our present program allows for a maximum time of four months on the ways, with a total elapsed time of seven months from keel laying until delivery of each ship. And we seriously anticipate that we may be able to reduce the time on the ways to three months, with another one and a half to two months in the wet basin, which means a total elapsed time of four and a half to five months from start to finish.

Design Features

These EC-2 ships have two complete decks, a raked stem and cruiser stern. The engines and boilers will be located amidships in a single compartment.

Hull design calls for seven main bulkheads, watertight to the upper deck and providing for five cargo holds. Further subdivision will provide deep tanks for water ballast or dry cargo in No. 1 hold, and for water ballast, oil or dry cargo in No. 4 hold. The ship will be provided with three cargo masts and one signal mast, with telescope topmast, all of steel.



Above: Plan of engine room of EC-2 type of vessel with triple expansion engine and water tube boilers. Below: Elevation of same engine room

These vessels will be 427 feet long at the water line, with 416 feet between perpendiculars. Their extreme breadth is to be 57 feet and their depth molded (upper deck) 37 feet, four inches.

On a mean draft of about 27 feet, eight inches, to the bottom of the keel plate the total displacement will be 14,100 tons and the deadweight will be 10,500 tons, with approximately 9150 tons deadweight for cargo. The total bale capacity will be approximately 468,000 cubic feet. They are expected to have a normal speed of about 11 knots, although they undoubtedly will be capable of more than that if occasion requires.

Also of an emergency type, very similar to the ship just described, there are 60 vessels being built in two Amer-

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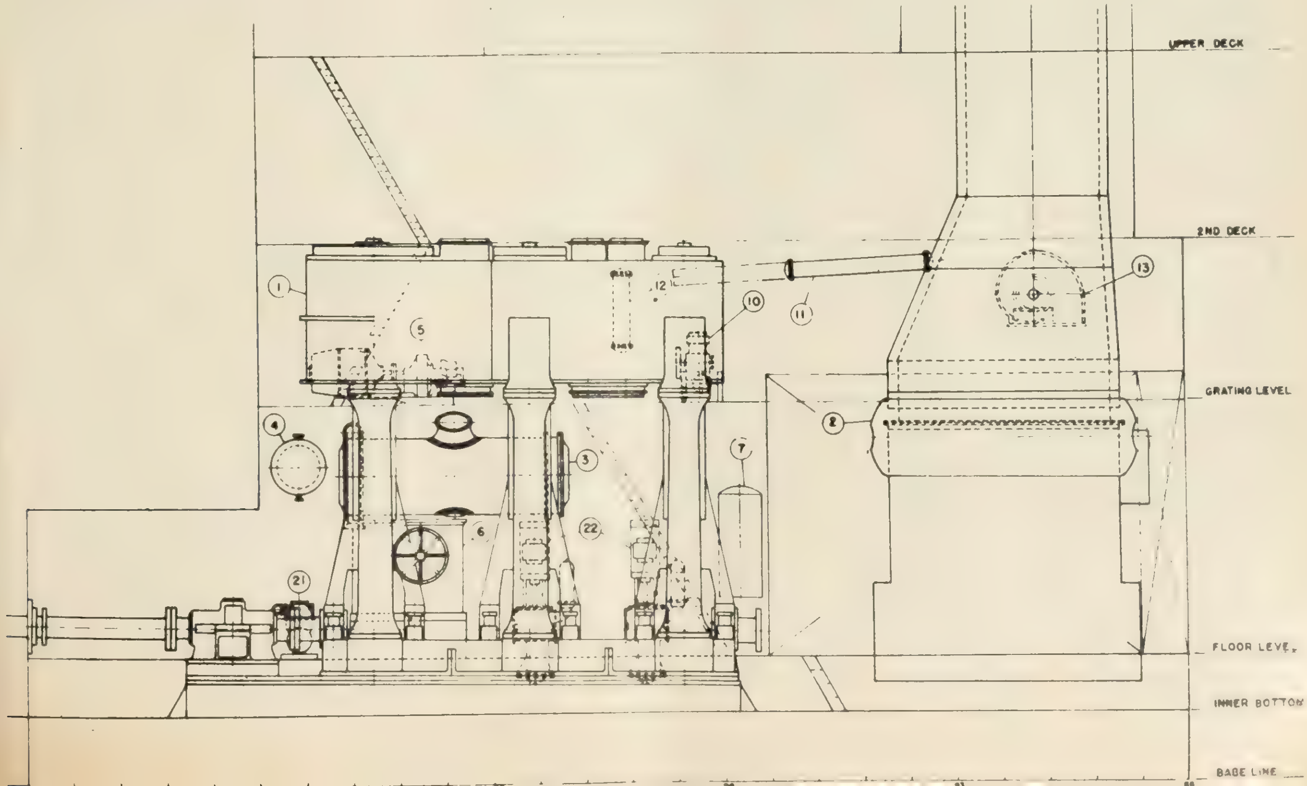


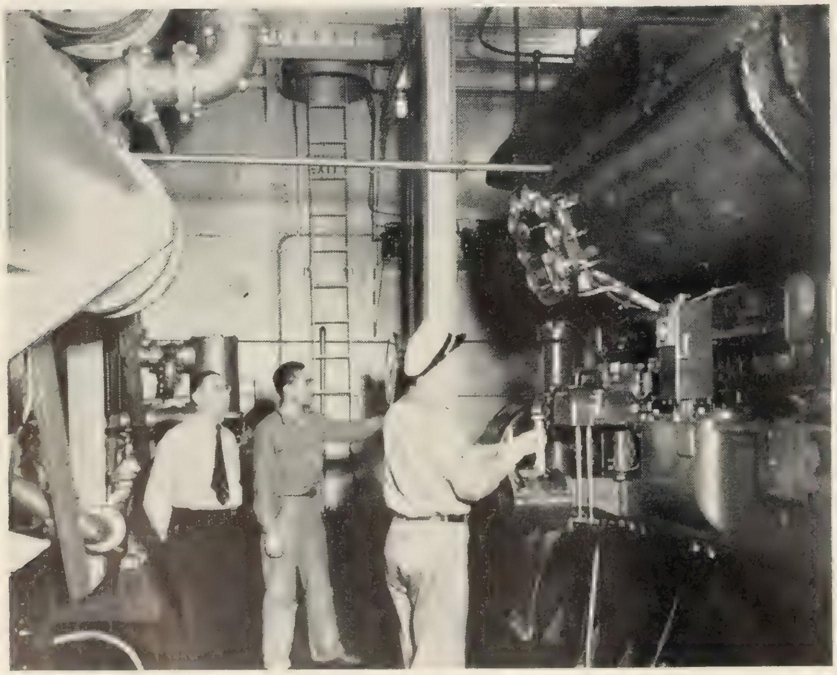
World's Fastest Ferry Fleet

by D. L. Pratt

Captain Alex Peabody, head of Puget Sound's Black Ball Line, operating the largest fleet of ferries in America, was up against an emergency.

Employment at the great Puget Sound Navy Yard, across the Sound from Seattle, was growing with unprecedented rapidity and the population of the city of Bremerton, where it is located, was keeping pace. From a few thousand three years ago, the Defense Program has increased the number of workmen at the yard to about 15,000, many of whom live in Seattle. Added to these are the thousands of sailors and civilians using this only route of travel between the two cities.

Already operating on this route at the first of the year were four fine diesel ships. Two of these, the Kalakala and the Chippewa, were the fastest and finest car and passenger ferries on the inland seas. The other two were assigned temporarily from the second fleet of San Francisco ferries purchased by Black Ball in the last few years. Although fine boats, they were not sufficiently commodious or fast to maintain the speed and the service which even a year ago Capt. Peabody could foresee would be essential to serve the enormous and numerous defense projects of the Kitsap Peninsula. No matter what happened after the war ended, he considered it a vital part of the defense effort that the Black Ball Lines should maintain an adequate service to take care of this travel.



The control stand in the engine room of ferry Willapa. Right to left: Chief Engineer Neil McCullough at the controls of the 2800 ihp Busch-Sulzer diesel engine, 3d Assistant Engineer John Sullivan, and David Bollinger, guarantee engineer for the Busch-Sulzer Bros. Diesel Engine Co.

Capt. Peabody is well known for his quick decisions and is a dynamo when he goes into action. Although he had already purchased a considerable portion of the San Francisco ferry fleet, deprived of service by the two big bridges, he arose to this emergency by going down to the "Golden Gate" city last fall and purchasing six more of a larger type. The best two of this group, the Santa Rosa and the Fresno, were placed immediately on the ways at the yards of the Winslow Marine Railway & Shipbuilding Co. on Bainbridge Island for conversion. Contracts were given late in November for two 2700 hp Busch-Sulzer diesel main propulsion units and two 450 hp generating units of the same make, and by the first of May, with upper works rebuilt and new power plant installed, the first of these boats, renamed Enetai, was placed on the run in steady service. By June 1, the second vessel, renamed Willapa, was also operating.

As a result, the Seattle-Bremerton run is today served with the four fastest ferries in the country, leaving from both terminals on an average of every 35 minutes from 6:15 in the morning till 12:30 midnight and covering the 15-mile route in approximately 55 minutes, in any tide or weather. Back and forth across broad Admiralty Inlet, through tidal Rich Passage, and Port Orchard Bay, always some of them are in sight, coming and going, until, with the 15 additional Black Ball ferries on other routes, the Sound resembles the old days on San Francisco Bay.

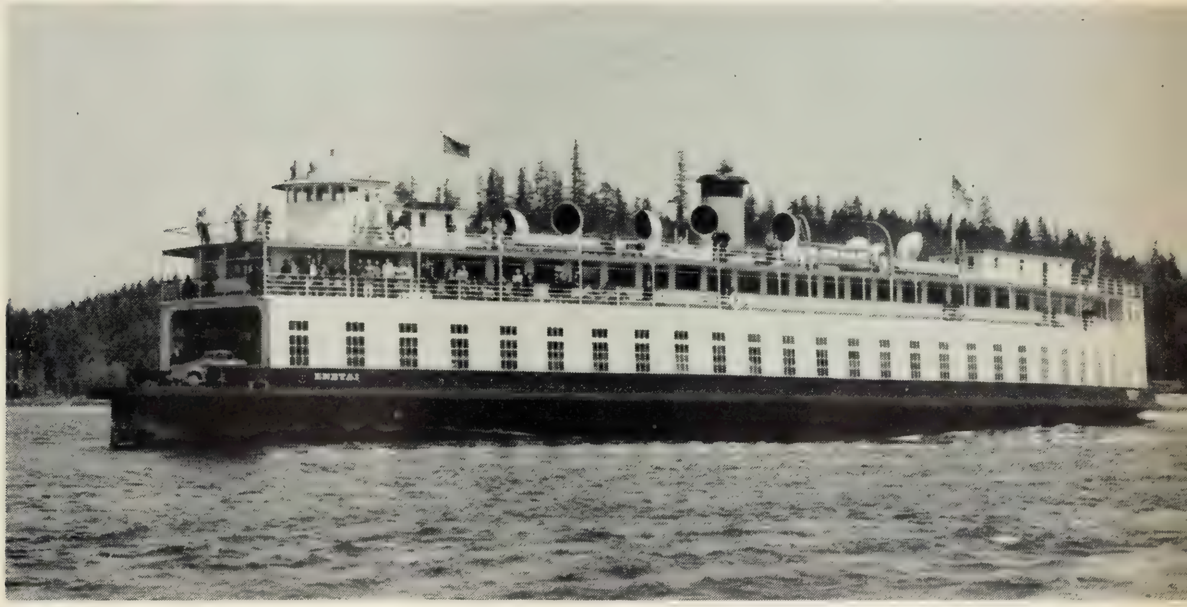
Of the Kalakala and Chippewa much was written at the time when they originally went into service, so that only a few facts are pertinent now. Kalakala was much publicized as the first streamlined ferryboat in the world

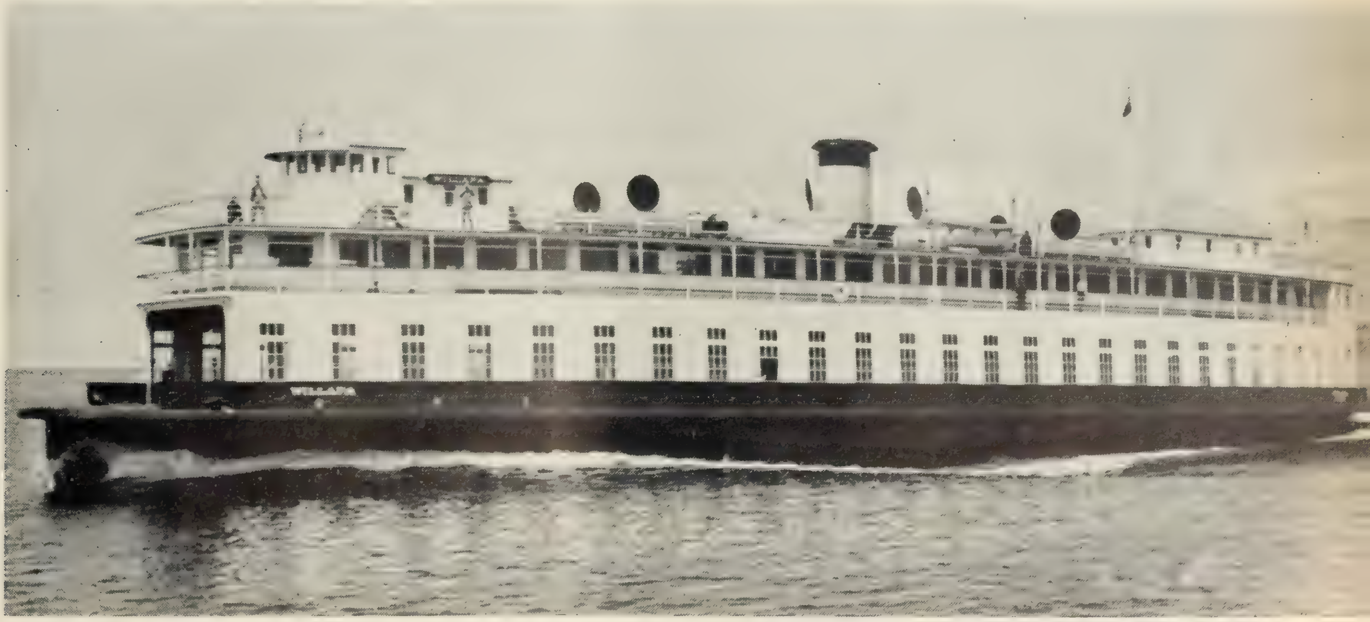
These three pictures show:

Ferry Chippewa

Ferry Enetai
(Photos by Marine Salon, Seattle)

Ferry Willapa
(Photo by A. A. Tachella)





One side of main cabin, ferry Enetai

and her pictures have appeared in hundreds of newspapers and magazines. She is 276 feet in length, is powered with a 3000 hp Busch-Sulzer diesel which gives her a speed of well over 17 mph. She carries 83 cars and 2000 passengers and started service on the Navy Yard route in 1935. Chippewa, formerly a Great Lakes steamer, was rebuilt into a ferry and entirely remodeled above the waterline. She is 235 feet long and her 2200 Busch-Sulzer drives her at 16½ mph. She went into service as a ferry in 1932 and can carry 1300 passengers and 65 cars.

Of the Enetai and Willapa, the two latest additions to the fleet, much can be said that is of new interest, for their recent conversion is important marine news and involves many interesting details. Both vessels with their new 2700 Busch-Sulzer diesels are capable of more than 17 mph, the Willapa being slightly the faster of the two, although the vessels are practically identical in design.

Reconstruction of the upper works of the two boats is uniform. The engine rooms and power plants are identical. Both hulls were rebuilt from the car deck up.

When the vessels were purchased from the San Francisco owners, the main passenger or second deck had an outside promenade space 14 feet wide, port and starboard. As more inside accommodation was needed for seating and to give shelter on the long run in rainy weather, this strolling place was reduced to four feet, allowing for forward and aft seats along the side, but adding about 20 more feet of width to the inside cabins. This makes possible three blocks of athwartship seating, separated by two fore and aft aisles. These seats are all upholstered with leather and are very comfortable. The smaller windows of the vessels were replaced by large plate glass windows all around so that wherever one is seated in any one of the cabins, a view is afforded in every direction of the alluring scenery of the islands, forests and mountains, which make this ferry voyage one of the most beautiful in the country.

The main cabin in these vessels runs about two-thirds of their length, broken only by a narrow section down part of its center which contains men's and women's rest rooms, passages to the upper and lower decks and, in an inset at the rear, a news stand. The cafe, open to the cabin in buffet style, is on the starboard side aft. Forward of the long cabin is a smaller observation lounge, and aft is a men's smoking cabin and a lady's cabin and special rest room. The upper deck is used as a strolling deck with additional seats for summer traveling. The main automobile deck has three car lanes on each side separated down the center with storage lockers and passages down into the engine compartments. These vessels each carry 86 cars and 1500 passengers.

Forward and aft of the forward and after bulkheads of the machinery space, are large fuel oil tanks. There is a partial bulkhead between the main engine room and the space for the auxiliary machinery. These vessels were originally double-enders. They now have only the single propeller aft to which the engines are direct-connected and reversible. The forward rudder has been retained for better maneuvering in cross tidal currents at the slips. Going down into the engine room, one encounters the switchboard flat on the same level with the engine room grating. There are two switchboards on each ship, one for the ac and the other for the dc electric auxiliary motors, the ac being a Westinghouse assembly and the dc by Trumbull Electric Company. Electric power for all lights, water and fuel pumps, air compressors, sanitation pumps, battery chargers, ice machine, sump and fire pumps and other equipment is controlled at these boards.

The main power plants are 8 cylinder 2-cycle, reversible, direct-connected diesels of the Busch-Sulzer DHMT Model with a bore of 20½ inches, a stroke of 27½ inches, and developing 2700 shp at 240 rpm. These engines are of mechanical injection, trunk-piston type and are similar to those used in the Chippewa and Kalakala. They operate on Pacific commercial No. 300 fuel. Scavenge air is supplied by an Elliott blower, driven by a 250 hp, three-phase, 60 cycle, 480 volt Elliott motor. Fresh water is used as the cooling medium for the engines. This circulating water and the lubricating oil are cooled in special heat exchangers made by the Condenser Service and Engineering Company. The auxiliary general service pumps are by De Laval. Pump motors are manufactured by Sterling at Los Angeles. All new fuel, water and lube oil tanks were made by the Acme Boiler Works of Seattle. Exhausts from the main engines pass through waste heat boilers, made by the Active

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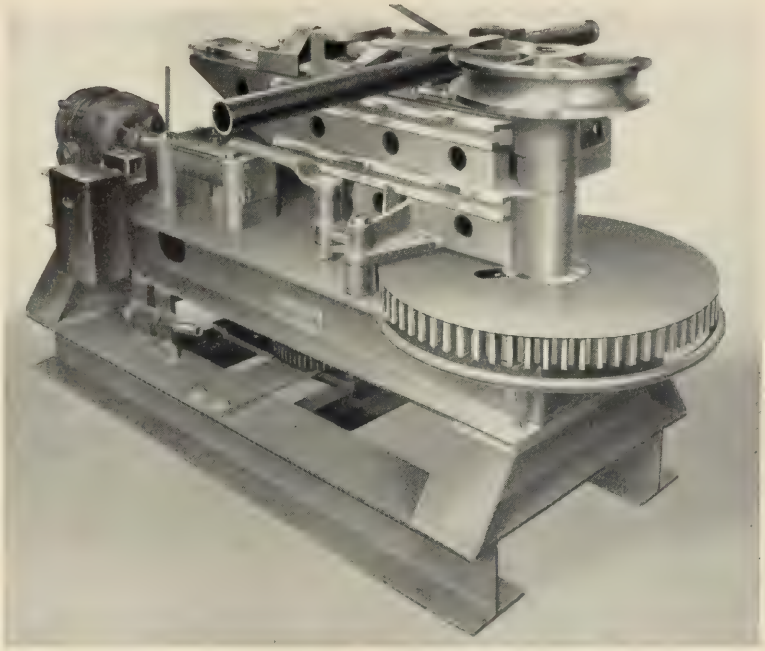
U. S. Pipe Bending Plant Expansion

Back in 1917, Phillip Wallace, Sr., who, up to that time, had been superintendent of the machine shop of the Moore Shipbuilding Company, evolved a machine for the cold bending of tubing and pipe. Establishing a small shop on the corner of Howard and Fremont Streets, San Francisco, he incorporated under the name U. S. Pipe Bending Company and built the new machine to order for the various Pacific Coast yards and fabricating shops. Practically all of the machines then built are in operation.

At the close of the war, this firm embarked on a policy of contracting for pipe bending work and discouraging the sale of machines. In 1927 they moved into new quarters at 840 Harrison Street, San Francisco, and increased their floor area to 8000 square feet.

When the present shipbuilding program began to open up on the Pacific Coast, there came a flood of pipe bending orders and the firm moved to 249 First Street, where they secured 15,000 square feet of floor area and found themselves almost immediately swamped with orders on National Defense work. In 1941 they again released the U. S. Pipe Bending machine for sale on the open market and have been receiving since that release a very satisfactory volume of orders for machines of various capacities.

The new shop is in a very advantageous location, directly opposite the First Street ramp of the San Francisco-Oakland Bay Bridge. However, the 15,000 square feet has already proved inadequate. The firm therefore acquired by purchase the shop and equipment of the C. H. Evans & Co. Machine Works at 287 Fremont Street, San Francisco. This sale was consummated on June 23, 1941 and on the same day mechanics moved into the shop to begin manufacture of the pipe bending machines.



Almost before the details of this purchase were completed, negotiations began for the acquisition of 14,000 square feet of additional space alongside the First Street plant. These negotiations are practically complete and the company expects to have improvements finished and machinery installed ready for operation in 60 days' time, so that their production program will be in full swing within three months.

The U. S. Pipe Bending machine is a conservatively designed and rated tool. It will stand up indefinitely when worked at its rated capacity. That capacity is based on its ability to bend extra heavy pipe of the toughest materials having the highest tensile strength, such as chrome-molybdenum and stainless steels. The standard machines range in capacity from 1″ diameter pipe to 24″ diameter pipe.

This conservative policy has built up confidence in the firm, and the moment it became known among the shipyards that these sturdy dependable pipe bending machines were available, the orders began coming in and a fourfold expansion in 12 months became necessary.

The firm is also expanding its lines. It has added welded pipe fittings and cast steel high pressure valves. Other lines auxiliary to the pipe bending business will be added as opportunity offers.

Among the shipyards represented in the recent orders for U. S. Pipe Bending machines are:

The Shipbuilding Division, Bethlehem Steel Company, plants at San Francisco, Alameda and San Pedro, California.

The Moore Dry Dock Co., Oakland, California.

The Todd-California Shipbuilding Corporation, Richmond, California.

The Richmond Shipbuilding Corporation, Richmond, California.

The Oregon Shipbuilding Corporation, Portland, Oregon.

Two assistant B. C.'s on the job

Beach Combers Loot

One P. M. R. reader after "glancing over" a recent installment of this column sends in this question:

"What is the difference between a thanksgiving turkey and myself?"

Can anyone tell him?

Hens in the Cabin
Lard in the Range

When the British ship Loch Sloy sailed out of Melbourne, Australia on her homeward voyage in 1896, she cleared Port Philip Heads on June 4, In her holds was a goodly freight list and in her cabins were eight passengers, two of whom were women.

At that season of the year, her master had every reason from long experience to count on those strong westerly winds, which have made the South forty latitudes in the Pacific Ocean and the long stretch from Australia and New Zealand to the Cape a source of great sustained speed records for the sailing ship. In fact, the sailing track of a ship "making her easting down" in these latitudes usually form a very fair imitation of the shortest distance between two points.

Not so in this instance, for almost immediately the Loch Sloy was faced with a series of Southeast and Northeast gales. Fighting these, she was 68 days beating to windward between Melbourne and Cape Horn, and a total of 133 days to the English Channel. In 1897 she made the entire distance in 85 days.

Of course, in a prolonged voyage of this character, there are usually many incidents both comic and tragic, and the voyage of the Lock Sloy was no exception.

On one occasion a huge sea came aboard at midnight, smashed the cabin skylight and broke up a big poultry coop. Awakened by the noise, the cabin passengers on opening their room doors were confronted by two feet of angry sea water and two dozen soaked, squawking, frightened hens.

Shortly after passing Cape Horn, the coal supply for the galley was exhausted, and the Captain faced with this dilemma, combined with the fact that he was already due in London river, decided to keep on his course and to burn in the galley range his spare spars, what packing cases he could muster and part of a shipment of lard.

One passenger, discouraged by all these adverse circumstances, left a note for the Captain and slipped over the side into the "cool quiet depths."

All of which goes to show that notwithstanding the wind rose charts and general trends of air currents the wind still "bloweth where it listeth," both for ships and for the human spirit.

Beachcomber as a Naturalist

In his walks abroad and sometimes far from beaches, our friend the Beachcomber, has evidently been quite observant to the habits of animals, fish and birds he has met. Here are a few of his observations:

Mud turtles and tortoise have no teeth.

All animals that chew the cud have cloven feet, but not all with cloven feet chew the cud.

Both bones forming the parrots beak are movable, while the majority of other birds can move only one.

The structure of the frog is such that it cannot breathe with its mouth open, and would suffocate.

Pigs are poor swimmers, and, owing to the fact that their front legs are set so closely under their bodies, they frequently cut their own throats with their cloven feet when they fall into the water and attempt to swim.

Hares cannot close their eyes since they have no eyelids. Instead, they show a thin membrane which covers their eyes during sleep.

The owl cannot move his eyeballs or eyes; they are fixed in their sockets by a strong, hard, elastic case in the form of a cone. But the owl can turn its head around in an almost complete circle without moving its body.

Fish swallow their food without chewing it. This they do because they are obliged constantly to open and close their jaws in breathing through their gills.

Sheep have no teeth in their upper jaws. A species of Turkish sheep have the most of their fat on their tails. In this breed the tails become so large that they have to be carried on small carts made of flat boards and two wheels.

Beachcomber also reports having visited the following towns, having curious name and state combinations:

Ash, Kan.; Carpet, Tex.; Mount, Wash.; Ogoo, Ga.; Odear, Me.; Skeleton, Ky.; Shoo, Fla.; Kay, O.; Houdy, Miss.; Fiven, Tenn.

Near one of these towns, being broke, he applied to a farmer for work. The farmer set him to sawing and chopping wood. All day long he worked heartily at the task and at night he was seemingly as fresh as ever. When the wood was all chopped and corded, the farmer took him down into the cellar and put him to sorting apples, throwing the good ones into a barrel and the poor ones into another. A few hours later the farmer looked in to see how he was getting along and found him almost exhausted, his brow beaded with perspiration, and he was only half through.

"What's the matter?" the farmer asked. "Surely that work isn't hard!"

"No, it's not exactly hard," Beachcomber replied, wearily. "But the strain on the judgment is awful!"

And so Beachcomber turned back to the sea shore again. With him all choice and judgment is warped by the old sea lure, for—

> Yonder the long horizon lies, and there by night and day
> The old ships draw to home again, the young ships sail away;
> And come I may, but go I must, and if men ask you why,
> You put the blame on the stars and the sun and the white sails and the sky.

This group of handsome beachcombers made quite a hit in Japanese social circles some forty years back when they lost their ship and won the hearts of half the geisha girls of Yokohama. Can any reader give us their names and titles?

The Animals Came in Two-by-Two

Beachcomber digs up some ancient jingles about the first recorded emergency shipbuilding effort

Building the Ark

A ship behovés the to dight,
Thi self shal be the master wright;
I shal the tell how brood, how long,
Of what mesure, and als how strong.
When the timber is festened wele,
Windé the sidés everich dele.
First binde it wele with balk and band,
And wind it sithen wele with wand.
With pické—loke it be not thin—
Plastre it well without and in.

Make them of bordes and wandes betwene,
Thus thrivandly, and not ouer-thin,
Loke that thi semes be suttly sene,
And nailed wele that thei not twin.

—*Anonymous (adapted)*

Noah's wireless

Noah & Sons, Ltd., Wooden Shipbuilders

Five thousand years before the days
Of Land or Vickery,
Old Noah built a record ship
From wood of gopher tree.

Associated in the firm
Were Japhet, Ham and Shem;
Their contract was a man-size job
And it was up to them.

Far greater architect had they
Than Sharp or Cox or Gibbs.
Her spec's and detailed plans were right
For keel and beams and ribs.

Each ceiling plank was fitted snug
And fastened well and tarred.
U. S. M. C. inspectors ne'er
Were seen in Noah's yard.

If union labor on the job
Got pennies, two a day,
They thought old Noah quite an ass
For giving them such pay.

And now, all stately and complete,
She stands upon the stocks;
Four hundred fifty feet her keel.
Lays out along the blocks.

She is not burdened with a name
From ancient clipper ships;
No charming matron at her bows
A champagne bottle flips.

But gently off her blocks, she floats
With eighteen thousand tons
And all the bold progenitors
Of Allies and of Huns.

If Maritime Commission hull
This record can dispute,
Let her get up 450 pounds;
We'd like to hear her toot.

News FROM THE PACIFIC NORTHWEST

by Daniel L. Pratt

As of June 15th

$76,000,000 New Ship Order

Up to a new and amazing total of $471,423,997 shot the Puget Sound shipbuilding total when an order was placed by the Maritime Commission with the Tacoma plant of the Seattle-Tacoma Shipbuilding Corp. for 30 more cargo vessels of the C-3 type, largest of the freighters ordered by the Commission. It was a contract totaling $76,000,000 in value and the largest dry cargo vessel award to any yard in the country out of the $312,000,000 allotment which was made on May 26. Next largest (in number) was an order placed with Federal of Kearny, N. J., for 24 C-2's, and, third, an order to Western Pipe & Steel at San Francisco for 17 C-3's. The new order for the Tacoma plant brings the Puget Sound orders above the total for the last world war of $450,000,000.

W. L. Green, general manager of the Seattle-Tacoma plant, said that, not considering the large amount of orders they already have on hand, it will take at least two years to fulfill this contract. It will be late summer or early fall before work can start, as even the matter of getting the immense amount of material required cannot be done over night. "Even though we anticipated this order and started building new ways some little time ago, this is a big job," he said, "but our plant preparation will permit us to start work as soon as materials are available. We estimate eight thousand men will be employed when the plant reaches the production peak in about a year."

Already awarded to the plant were 11 cargo vessels, two of which have been delivered, five Navy tankers awarded about 60 days ago, making a total, with the new contract, of 46 vessels.

Fifth and last of the five C-1, 5000-ton motorships which the company has had on order, the Cape Douglas was launched at the plant June 10, being christened by Mrs. R. J. Lamont, wife of the president of the company. Already delivered to their operators, the American Mail Line of Seattle, are the Capa Alava and the Cape Flattery, and already launched and nearing completion are the Cape Fairweather and Cape Cleare. From now on the yard will be devoted to the construction of the five fast oil tankers and the C-3 cargo vessels. Six of these were already on order before the new order for 30 was placed. Keels of three of these have already been laid, the last two, No. 7 and No. 8, on June 17 and 18.

Wood Ship Program Begins

On June 4 contracts, involving 18 wooden minesweepers at a total cost of $6,000,000, were placed with three Seattle yards and one Bellingham yard. Associated Shipbuilders, already under contract to build four steel seaplane tenders, will construct six of the new boats, while the Seattle Shipbuilding & Drydock Corp., the Ballard Marine Railway and the Bellingham Marine Ways will build four each. It is estimated that these armed Navy vessels will be turned out in about 18 months, the first in about 8 months from laying of first keel. Contracts for ten similar vessels were let to Tacoma yards about two months ago.

It is understood that the work assigned to the Associated Shipbuilders will be carried out at their Lake Union plant, the Lake Union Drydock & Machine Works. It is also reported that the Bellingham yard, under a new lease, may be enlarged to handle other work of this nature that is in the offing.

More Expansion For Army Depots

Further plans for expansion—in fact, for trebling—the facilities of Army quartermaster depots in Seattle, including those under construction and contemplated, were revealed May 5,

Leaving Astoria for Vladivostok this spring, the Russian freighter Vazlov Vorosky, with a load of American machinery and other supplies aboard, lost control of her steering and was swept on the treacherous sands of Peacock Spit where the seas broke her in three pieces. The vessel is still partly above the water and the Foss Co. and other interests have managed to salvage considerable cargo for the Armtog. The picture shows her the day after she was grounded, already breaking in three pieces. (Photo by Marine Salon, Seattle) when the House appropriations committee recommended the expenditure of $7,750,000 for this purpose. It is understood that only $2,750,000 will be used to add to the enlargement of the new terminal at the old Pacific Steamship property, and that the balance would be used for some other improvement on another section of the waterfront, the nature of which has not yet been made public.

New Drydock For Todd-Seattle

Plans for a new million dollar drydock as an addition to the facilities of the Todd-Seattle Drydocks plant on Harbor Island were announced June 18. R. J. Lamont, president of the company, said that additional drydocking facilities in Seattle had been under consideration for some time, and that, while no contracts had been signed, he considered the improvement a certainty. The dock will be of an intermediate type, smaller than the 15,000 and 16,000 ton docks now in use at the plant.

Navy Pursuit Craft Started

Keels of two Navy pursuit craft—each a 107-foot Douglas fir job—were laid at the Kruse & Banks shipyard at North Bend, Oregon, last month. The dedication ceremonies were attended by Lieut. Commander C. H. Hibbard, Portland Navy inspector, and H. Rasmussen, shipbuilding inspector, who was sent there from California to inspect the work on the vessels and on two more that are to be built there later.

Large Drydock At Vancouver

A $600,000 drydock large enough to handle all types of freighters is being built in North Vancouver, according to announcement of Clarence Wallace of the Burrard Drydock Co. The new dock will supplement the company's present 20,000-ton dock, and will probably be in operation by the time this is published. The dock will be 440 feet long, 100 feet wide, built in sections and capable of expansion.

Nature Improves Grays Harbor Bar

Although millions have been spent in the past to maintain a good depth for ships crossing Grays Harbor bar, it remained for nature to do a good job of it. Ocean currents and the action of storms, according to Capt. Munter, head of the Coast Guard at Seattle, have opened a new and better channel into the harbor than the one that has been in use. Controlling depth of the new channel is 30 feet and it is believed it will be more easily maintained than the former channel. After careful investigation, the Army engineers and Coast Guard have decided to move buoys and markings from the old channel to the new.

Marine Shorts

The Motorship **Boxer,** which was left in the ice of the Kuskokwim River last fall due to an accident which made it impossible to get her out in time, arrived in Seattle June 18 in tow of the Coast Guard cutter **Redwing.** She will be resurveyed, after which bids will be called for on the installation of a new propeller and for general overhaul.

* * *

The Seattle ship **North Haven** of the Northland Transportation Co., which left here January 27 for Africa, will upon her return about July 20, start loading another cargo for the Far East, this time under charter to the Girdwood Shipping Co. **North Wind,** another ship of the same fleet, now on her way to China as a cargo carrier, will make her return voyage in the service of the American President Lines.

* * *

Fishermen, tugboat operators and power yacht skippers and engineers are responding readily to the new class which the United States Navy recently established for the manning of the local defense force. Pay in the new class ranges from $26 to $99 per month and the ratings are from apprentice seaman to chief petty officer. Food, quarters and medical and dental service are supplied. Navy officers said that on May 1 there was a 26,761 deficiency of petty officers in the Navy, indicating that chances for promotion in the new class are promising.

* * *

Completely overhauled and repaired during a stay of 60 days on the Lake Union Drydock, the Coast Guard cutter **Cedar** cleared for her base in Ketchikan to take up her tough summer and winter service in the north, after having had $80,000 expended on her. The sturdy vessel services lighthouses and other aids to navigation as for north as the Aleutians. She is the largest lighthouse tender in the service, 201 feet long overall, with 1500 hp steam engines.

* * *

The largest and finest vessel of its type ever seen in Tacoma, the tuna clipper **Anna M,** built by the **Western Boat Co.,** took to the water late in May, and will be completed in July at a cost of about $175,000. She is 113 feet in length, powered with at 525 hp Enterprise diesel and was built to the account of William Magellan and associates of San Diego.

The Russian merchantman **Shaturstroi** left Portland June 5 with the fifth cargo of American machinery destined to Russia from that port this year. Two other cargoes are being assembled and were to be loaded on the freighters **Orochon** and **Bolshoy Shanter** when they came off drydock. One of the five cargoes was aboard the **Valaz Vorovsky** when she went on Peacock Spit. This is being salvaged.

* * *

Bridges on San Francisco Bay put most of the ferries out of business, so they were all brought up to Seattle. Another big bridge, the Lake Washington floating bridge at Seattle, put the ferry **Mercer** out of business, so she is being sent to California. Figure that out, if you can. Anyway, it's one thing we can't blame on Harry. The **Mercer** is on the ways at the Winslow Marine Railway & Shipbuilding Co., where she is receiving considerable overhauling and remodeling and her hull sponsoned out. Later, bids will be asked to tow her down the coast where she will be used by the Los Angeles Harbor Department to ply between the mainland and Terminal Island.

* * *

Waterman Steamship Company's new freight service to the Orient began with the sailing of the **Gateway City** early in June. She arrived in Seattle June 5 from the east coast for Sudden & Christenson. C. F. Sharp & Co., local agents, said her sailing will be followed by occasional others in this new transpacific service.

* * *

The steamship **Olympic,** a combination ferry and passenger ship, has been purchased from the Black Ball Line by the Army and is being built into a troop transport by the Winslow shipyard. It is understood she will be used out of the Panama Canal. She was built in 1913 and originally called the Sioux and until last September oper-

(Page 59, please)

News FROM THE PACIFIC SOUTHWEST

by K. M. Walker

As of June 15th

Shipbuilding Boom Forecast

President John A. McCone of the California Shipbuilding Corporation of Los Angeles foresees a payroll of $25,000,000 annually with some 15,000 men employed in the Los Angeles area shipyards. This forecast is based on the plan of the Maritime Commission to build twenty-five per cent of its scheduled 750-odd new ships on the Pacific Coast. When asked where these men were to come from, Mr. McCone stated that there are twenty special schools in this area which soon will be providing a thousand trained men a month. Mr. McCone did not appear to consider the question of manpower to be nearly as serious as that of transportation, claiming that the transportation systems of Los Angeles and Long Beach are not nearly sufficient to take care of the men needed. Most of these men will be employed on Terminal Island, which offers little in the way of home facilities, and will have to commute from the several nearby towns. This will tax the present bridges and roads to their limit in the near future and wider roads and bridges will be an immediate necessity.

Crew Problem Becoming Serious

Steam pressures of four hundred pounds and over; efficient and fast steaming water tube boilers developing a horsepower for each half pound of fuel with the aid of feed water economizers and combustion air heaters; a high kilowatt hour electric output to operate complicated electric auxiliaries; low voltage cut-outs which automatically kick out and plunge the ship in darkness while stopping practically all machinery if the steam pressure is allowed to drop; and a myriad of valves, each with a definite and important function, to be mastered; requires a degree of engineering ability not common to our merchant marine in the past. This picture is presented by the new Maritime Commisison ships now going into service. These ships are the result of a far-sighted plan of the Commision and the number of vessels needed is far greater than was originally envisioned. While shouting the cry of "Ships and more ships," we seem to have deafened our ears to the echo which sardonically comes back with "Crews and more crews." Engineers capable of handling such highly technical floating laboratories are not turned out in the few months in which the ships are built and the problem of finding such men is admittedly becoming serious. As it is, the ships must now be sent to sea with one or possibly two men experienced with such power plants who must select the most promising material from the fast dwindling list of available men, and, while attending to their multifarious duties, find the time to drill them in both the technical and practical aspects of their job. Clearly, a more practical means of training is badly needed, as a ship at sea with lives and goods at stake is no place to experiment.

Big Dredge Being Reassembled

A few weeks ago, the Case-American Construction Company received a contract to dredge 22,260,000 cubic yards of the San Diego Bay bottom at a cost of $2,381,820 and deposit the spoil to reclaim 115 acres of land on the inside of the Silver Strand for Navy seaplane landing and shops and 215 acres on the ocean side of the strand for a housing development.

A contract of this size requires a powerful dredge, and, none being available on the Pacific Coast, the Case-American Company bought a 30 inch electric suction dredge then operating in the Platte River in Nebraska. Dismantling the machinery and cutting the hull into pontoons, they loaded it onto freight cars, shipped the entire machine over the Rocky Mountains and unloaded it at the foot of Dewey Street onto the sand beach of San Diego Bay. Here it is being reassembled, with a new fifty foot section being added near the after end to make the total length of the hull 125 feet. With a beam of 40 feet and depth of hull of ten feet the completed dredge will draw 5′ 6″ and will be capable of a cut forty five feet below the surface. High voltage current will be taken from shore power lines and reduced in transformers aboard the dredge to drive the 4000 horsepower electric motor for the 30 inch centrifugal dredge pump.

For the past two years, a heavy dredging program has been under way in San Diego, and, by December 1 of this year, the harbor will have safe anchorage for about 400 ships of all types. However, this still leaves more than half of the original bay area with a depth average of six feet below mean lower low water and quite useless except for small boats and seaplane landing areas.

New Clipper Makes Good Voyage

The Harbor Boat Building Company, Terminal Island, delivered the 102-foot tuna clipper St. George late in March to the Balestreri family at a cost of $156,000, and the new ship departed for the fishing banks in the face of reports of bad weather and poor fishing. This vessel is completely Fairbanks-Morse powered with a 300 hp two-cycle, direct reversing, pump scavenged main engine, two 120 hp 80 kw generating plants and one 40 hp, 20 kw, stand-by generating plant all full diesel. Hold capacity is 155 tons of tuna, which can be held at 10 to 15 degrees temperature by the dry refrigerating plant installed by the Gay Engineering Corporation.

Despite the unpromising fishing forecast the new vessel was gone two months and returned with 125 tons of tuna in tip-top condition and reported water clear and warm and tuna schools fairly plentiful. At the going rate of $130 per ton, this cargo should produce a nice return for a maiden voyage.

Copra Trade Resumed

As the result of action by the United States Government in stopping the shipment of copra from the Philippines to Russia and Germany, it appears that shipments of this commodity will be resumed to San Diego. The Government claimed that most of the Manila and Iloilo production of copra was being bought by Japanese interests who sent it via the Trans-Siberian Railroad to Russia whence it was delivered to Germany, where it has a vast use in the production of essential oils, feeds and synthetic products.

Early in July the first cargo of 3500 tons will arrive in San Diego for delivery to the Aceites Vegetales de Tecate, who have been operating their plant on domestic and imported soy beans, but will resume production of coconut oil, for which the plant was designed. The last copra cargo into San Diego arrived in February 1940 when the Salamaua dropped several thousand tons.

Star of Scotland Resumes Name

It has been a long time since the Los Angeles Dry Dock Company lifted a sailing ship, but early in June the blocks on their floating dock were set to take the deep hull of the Rex, ex Star of Scotland, ex Kenilworth, and the big wind ship was lifted for examination by Lloyd's surveyors. After cleaning the accumulation of sea growths from her iron plates and drilling them, she was pronounced "a wonderful old ship" by Mr. Dave Miller of Lloyd's San Francisco office, who flew down to personally inspect this interesting vessel. It was necessary to renew but two shell plates forward, do a slight amount of welding and rebush the pintle bearings and fit new pintles to make the underwater parts of the hull ready for sea.

After floating, the ship was towed back to Newport Beach, where she is being re-rigged as a six-masted schooner, and will carry the name Star of Scotland to sea in the early fall. She is attracting a great deal of interest and almost daily is visited by someone who sailed as a member of her crew. One visitor, bent under the burden of years, claimed to have helped in her building on the Clydebank fifty-four years ago and said she was "A hand built ship, four years on the stocks."

Yard Notes

A new boat building plant, that of Hollinger & Millikan, has been commenced near the foot of 28th street in San Diego. They have acquired 135 feet of frontage on the bay and have commenced construction of a 78-foot tuna clipper for Victor Bregante of the Bregante Sea Foods Company.

The new 200-ton marine railway designed and built by Tony Martinolich at the Martinolich Shipyard was hurried to completion to take the Mexican motorship Santo Tomas, once the three-masted lumber schooner Ruby, which broke her tail shaft off Turtle Bay when north bound into Ensenada with general cargo. This vessel in no way taxed the capacity of the new drydock, displacing less than a third of the tonnage limit of the new ways, and Tony is itching for a sizable ship to demonstrate the qualities of his particular pride. The Santo Tomas was completed June 13 and was followed on the new railway by the clipper Liberty.

The harbor development plans have proceeded to the point where dredging and filling for the new Harbor Drive around the north end of San Diego Bay will soon commence. This will leave several of the yards, including the General Marine, Harbor Boat Works and Robbins Engine Works, high and dry with a teeming boulevard between their several marine railways and the water. Negotiations for new sites are under way and at least one of the yards affected plans a considerable increase in facilities if proper space can be found on the lower bayshore.

NORTHWEST NOTES

(Continued from page 57)

ated between Port Angeles and Victoria. She was one of the few ocean-going craft owned by the Black Ball Line. Present conversion work consists mainly in transforming her automobile deck into sleeping quarters for troops.

* * *

Short-Shorts

Commandeering of ships by the Government for defense services has greatly reduced intercoastal sailings from Puget Sound ports at a time when traffic is very heavy.

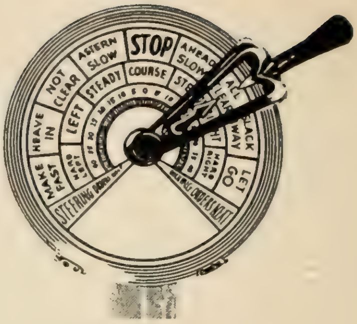
The House on June 4 unanimously approved legislation authorizing the Navy to spend $50,000,000 in providing section bases for small boats.

Personal Gleanings

Captain Charles Carlson of the **North Pacific** was glad that his ship made such a quick trip north, as it enabled him to deliver on time his annual present of the largest bunch of bananas he can buy in Seattle to the children of the Moravian Mission at Bethel . . . **A. R. Linter,** manager of the American Mail Line, flew back to the launching of the $2,300,000 **China Mail** at Chester, Pa., which is to be assigned to his company by the Maritime Commission. . . . Hosts of friends up and down the Coast mourned the passing recently of **Capt. J. L. Anderson,** well-known ferry operator on Puget Sound and Lake Washington. Anderson founded the Lake Washington Shipyards at Houghton. . . . **Horace F. Chapman** has been elected president of the Seattle Port Commission, replacing **Smith M. Wilson,** who in turn will remain as vice president. **J. A. Early** was re-elected secretary and **Col. W. C. Bickford** will continue as chief engineer and port manager. . . . **L. J. McNamee,** purser of the **Aleutian,** is back from a honeymoon through the eastern states. . . . **Capt. Eldred Hanson,** master of the **Taku** of the Alaska Transportation Co., has been called for active service in the Navy with rank of lieutenant. His place on the Taku has been taken by **Capt. Chris Ross.** . . . **Capt. George Warrington David,** Coast Guard officer, who has reached retirement age, was recently honored by a special meeting of officers and men at C. G. headquarters in Seattle. . . . **Capt. John T. Jones,** pioneer towboat operator and salmon packer, passed away early in June, aged 73.

Steady as you go!

KNOWLEDGE IS THE STRAIGHT COURSE TO ADVANCEMENT



A Department for Deck Officers

by "The Skipper"

Questions Welcomed. Just Address "The Skipper," Pacific Marine Review, 500 Sansome Street, San Francisco, California

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WIRE ROPE

II—SLINGS AND HITCHES

QUESTION

What is the method of attaching a load to a rope?

ANSWER

Nearly all loads to be lifted are attached to the lifting rope by means of slings, and this holds good whether the lifting rope be manila or wire, or the lifting is done by chain. In the great majority of cases on shipboard up to very recent times, slings were made of manila rope, but today there is an increasing use of wire rope.

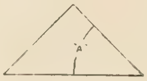
QUESTION

How can I know the safe load for a sling?

ANSWER

In making a sling, great care should be used in selecting materials. A very unsafe practice, too often followed, is to make up slings from the least damaged portions of discarded manila or wire rope. Sling service is among the most brutal imposed on rope or chain and the best material available is none too good. Rope for slings should be chosen for strength, for splice efficiency and for ability to equalize strain on sharp bends. Recognizing the importance of safe slings, manufacturers of wire rope make special compound-lay ropes for sling work. Special wire ropes for this purpose have left-lay and

Sling Load Chart



This chart illustrates the variation of stress on one sling leg when applied to a constant 1000 pound load at various angles "A"

The stress on each leg of a sling assembly is found by the formula: $S = \frac{W}{N \times \text{Sin ``A''}}$, where "S" is the stress on one leg, "W" is the total load, "N" is the number of sling legs employed, and "A" is the angle of lift

LOAD CHART of Sling Stress at Various Angles of Inclination

VERTICAL LOAD	SINE of ANGLE "A"	SLING STRESS	ANGLE
			0°
1000 lbs.	.08716	11473 lbs.	5°
1000 lbs.	.17365	5759 lbs.	10°
1000 lbs.	.25882	3863 lbs.	15°
1000 lbs.	.34202	2924 lbs.	20°
1000 lbs.	.42262	2366 lbs.	25°
1000 lbs.	.50000	2000 lbs.	30°
1000 lbs.	.57358	1743 lbs.	35°
1000 lbs.	.64279	1555 lbs.	40°
1000 lbs.	.70711	1414 lbs.	45°

VERTICAL LOAD	SINE of ANGLE "A"	SLING STRESS	ANGLE
1000 lbs.	1.00000	1000 lbs.	90°
1000 lbs.	.99619	1003 lbs.	85°
1000 lbs.	.98481	1015 lbs.	80°
1000 lbs.	.96593	1035 lbs.	75°
1000 lbs.	.93969	1064 lbs.	70°
1000 lbs.	.90631	1103 lbs.	65°
1000 lbs.	.86603	1154 lbs.	60°
1000 lbs.	.81915	1220 lbs.	55°
1000 lbs.	.76604	1305 lbs	50°
1000 lbs.	.70711	1414 lbs.	45°

EXAMPLE

Problem: 100,000 lbs. is to be lifted by a 4-leg sling assembly, each leg lifting at an angle of 45° What will be stress on one leg?

Procedure: (See Formula at top of page)

W = 100,000 lbs.; N = 4; Sin 45° = .70711

$S = \frac{100{,}000}{4 \times .70711} = 35{,}355$ lbs. (Stress one leg)

Had the legs all been lifting vertically, (A = 90°; Sin 90° = 1), the stress in each leg would have been only

$\frac{100{,}000}{4 \times 1} = 25{,}000$ lbs.

right-lay strands braided together to make a rope that is exceedingly strong, very flexible, and resistant to spinning and kinking. Table I shows the safe load on one leg of a sling, for each of ten common sizes in each of four types of sling material, *i.e.*, braided wire rope, common wire rope, iron chain and manila rope. Note that the figures given are for a vertical one-leg sling.

QUESTION

Most slings have legs at an angle. How do I compensate for the angle?

ANSWER

The angle of the leg makes a tremendous difference in the stress on that leg. The formula for figuring this increased stress is given at the top of Fig. I. Note how fast the stress goes up when the angle begins to flatten out below 45°. It is very good practice to make sling legs long enough to keep the angle with the horizontal above 45° and as near to vertical as is practicable under the existing circumstances. The sling load chart, Fig. I, shows how important factors of safety are. Table I uses the factors of safety 3, 5 and 7, and 5 is recommended for general use. Suppose you wanted to lift a large case of machinery weighing eight tons, using a four-leg sling. The table indicates ½-inch wire rope, but that is for vertical sling legs. The bulk of the load and limited vertical clearance force you to use a flat angle for sling legs, say 20°. The load chart indicates a load on each leg equal to 2.924 times the 2-ton load on each leg if the sling were vertical. That gives a load on each leg of 5.848 tons and your factor of safety is reduced to 1.7. If you had to flatten the sling to 10°, your safety factor would have disappeared and the rope would be subject to a strain greater than its ultimate strength.

QUESTION

What are some of the types of slings most frequently used?

ANSWER

Figure 2 shows graphically some of the more common types of slings and hitches. It is self-explanatory. On shipboard in handling miscellaneous general cargo, a platform sling is frequently used. On the Pacific Coast these platform slings are almost universally

(Page 65, please)

Table I

Composite Sling Chart

(Safe Loads in Tons of 2000 Lb.)

Atlas 8-Part Slings — 1 Leg Vertical—(90°)

Size, In.	Safe 3	Load 5	Factors 7
⅛	1.29	0.77	0.53
3/16	2.85	1.71	1.22
¼	5.41	3.25	2.72
5/16	8.40	5.04	3.71
⅜	11.76	7.06	5.04
7/16	15.68	9.41	6.72
½	20.16	12.10	8.64
9/16	25.20	15.12	10.80
⅝	30.98	18.59	13.28
¾	44.24	26.54	18.97

Monarch Slings — 1 Leg Vertical—(90°)

Size, In.	Safe 3	Load 5	Factors 7
⅜	1.79	1.20	0.85
½	3.42	2.05	1.49
⅝	4.27	3.15	1.93
¾	7.50	4.50	3.21
⅞	9.44	5.67	4.05
1	12.32	7.39	5.29
1¼	16.81	10.09	7.20
1½	24.10	14.46	10.33
1¾	29.87	17.93	12.90
2	38.75	23.25	16.60

Iron Chain Slings — 1 Leg Vertical—(90°)

Size, In.	Safe 3	Load 5	Factors 7
⅜	1.50	0.90	0.64
½	2.50	1.50	1.07
⅝	3.51	2.31	1.67
¾	5.63	3.38	2.70
⅞	7.78	4.67	3.33
1	10.33	6.20	4.43
1¼	16.00	9.60	6.83
1½	22.60	13.60	9.70
1¾	29.16	17.50	12.80
2	37.00	22.20	15.83

Manila Rope Slings — 1 Leg Vertical—(90°)

Size, In.	Safe 3	Load 5	Factors 7
⅝	0.66	0.40	0.28
¾	0.81	0.49	0.35
⅞	1.16	0.70	0.50
1	1.37	0.82	0.58
1¼	2.08	1.25	0.89
1½	2.75	1.65	1.18
1¾	4.08	2.43	1.75
2	5.00	3.00	2.14
2¼	6.41	3.85	2.75
2½	7.25	4.35	3.10

Three safe load ratings are given for convenience of selection. A factor of 5 is recommended for general duty, a factor of 7 for hard, continuous usage and a factor of 3 only for occasional use.

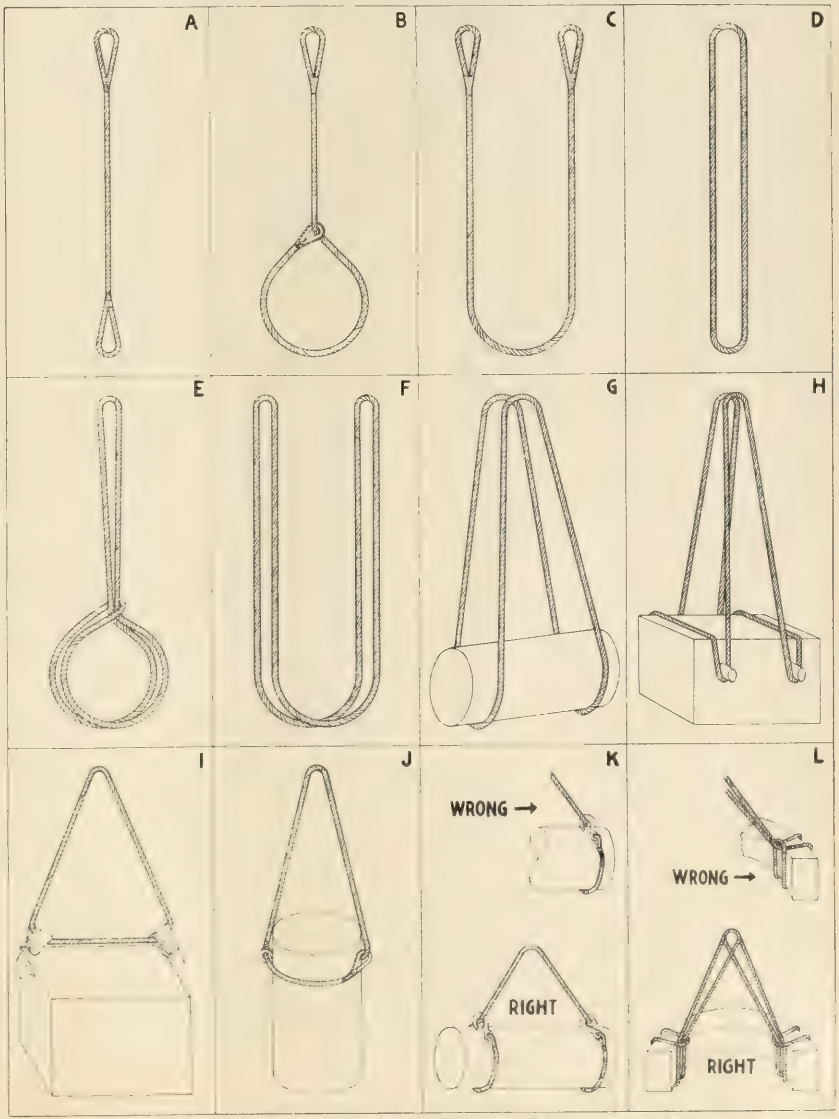


Fig. 2—Common Types of Hitches. To Compute the Safe-Loads of Hitches B to J included Multiply the Safe-Load for One Leg Vertical (Table I) by the Efficiency Factors Shown in Parentheses for Each Type of Hitch.

A—One Leg Vertical Safe Loads as in Table I B—Anchor Hitch (0.75) C—Basket Hitch (1.414) D—Endless Sling (1.414) E—Endless Sling Anchor Hitch (1.414) F—Endless Sling Basket (2.828) G—Inverted Basket Hitch (2.828) H—Toggle Hitch (2.828) I—Stone Dog Hitch (1.414) J—Double Anchor Hitch (1.414) K and L—Bridle Anchor Hitches, Right and Wrong Methods

UNITED STATES
DEPARTMENT OF COMMERCE
BUREAU OF NAVIGATION AND
STEAMBOAT INSPECTION

LICENSE TO CHIEF ENGINEER OF STEAM VESSELS

This is to certify that U.S. Engineer having been duly examined by the undersigned United States Local Inspectors Bureau of Navigation and Steamboat Inspection for the district of San Francisco, as to his knowledge of steam machinery and as to his experience, and found to be competent is hereby licensed to act as Chief Engineer on — condensing — Ocean — steam vessels of any gross tons, for the term of five years from this date.

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ENGINEERING THERMODYNAMICS

QUESTIONS FROM THE SHIPS

QUESTION

In your column in the Pacific Marine Review, you offer to anyone writing to "The Chief" a catalog of ball and roller bearings. I am a young steam and diesel marine engineer and would appreciate you sending me one. Thanking you for the troubles that I have put you to, I remain,

G. E. C.
Baton Rouge, La.

ANSWER

Catalog and booklet on engineering data has been mailed to address given.

QUESTION

I am 3d assistant engineer on SS R. W. Gallagher and have been reading your articles in the P. M. R. and have found them very useful and now I have a question I wish a little help from you on.

On this particular ship which is a new one having Foster Wheeler K type boilers and a completely inclosed feed water system, we use the evaporator to distill the fresh water from ashore before it is used as feed water the evaporator exhausts its vapor into the back pressure system (auxiliary exhaust) at 10 lbs. gauge pressure, now to make a long story short we make very little water!

Now here is my idea of course it is all paper work taken from steam tables at present the water must be heated to 260° F. to make it boil under 10 lbs. gauge pressure. Now I think if this vapor was carried up say 30 ft. in the air for a precaution against priming, then down to the main condenser where there is an absolute pressure of say 1½ lb. with a corresponding temperature. I believe with this arrangement and the present 65 lbs. of steam for the evaporator use we should double the water output.

As you can see this is all theory on paper and I wish you would tell me of any practical reason why this should or should not be a good way to do it.

Thanking you again for any help.

Yours truly,

H. H. G.

ANSWER

This is a very practical question and illustrates nicely the need of some consideration of thermodynamics.

The scheme proposed is absolutely alright except for the thermodynamics of the problem. More steam would be made because of the large increase in the temperature difference between the 65-lb. steam and the vacuum. This would force more heat through the walls of the heat exchanger [evaporator]. Probably two or three times as much water would be made as at present. A baffle might have to be designed to prevent carry-over, as suggested in the question.

However, we would pay a high price for the water made in fuel used. In as much as we must make steam from salt water in order to get fresh water, we should also get the mechanical energy or available work in this steam out of it before condensing.

To illustrate: assume a perfect evaporator, no temperature drop through the walls of its tubes, we could turn live steam into the coils and make steam at the same pressure which could be used as live steam. And the greater the temperature drop from steam to salt water, the faster we transfer heat, but the more useless the steam from the salt water is and the less mechanical work available in it. If we get no energy from this steam, or cannot use it in heating feed water or other useful purpose, then all the heat used in evaporating is wasted and its fuel equivalent is wasted, making fresh water very expensive.

By turning this evaporator steam into the auxiliary exhaust at 10 lbs. it is useful because a large part of this 10-lb. steam line is used for feed heating and other purposes. It may be fed back into the turbine in some cases.

Another consideration in this question is that we really don't know how much fresh water we are making as we don't know the water loss on the ship; and, if we make only as much as we lose, there would be no gain in water. Instead of making only a little water, perhaps we are making a normal amount and losing a good deal. Some idea of this can be obtained by shutting off the evaporator for a watch and carefully note the decrease of water in the system.

Another factor is that scale on the tubes of the evaporator will slow up the heat transfer very rapidly, thus reducing the fresh water made.

Will other engineers please write in their comments on this question?

THERMODYNAMICS—II

The first real accomplishment in the study of dynamic heat is to understand thoroughly its difference from temperature.

Temperature is a potential condition to which all matter is subjected. Measured in degrees it can only be used to measure the relative difference in thermal conditions between two or more bodies.

Dr. Fahrenheit early recognized the necessity of measuring this condition. He mixed ice and salt and assumed this to be the coldest condition possible. He called this zero on his thermometer scale. He took the blood temperature as a standard reference and called it 100 degrees. Dividing the distance on his scale into 100 equal parts, he extended the scale upward, using divisions of equal length. Later, the standardized scale located boiling at sea level at 212 degrees. On the scale it was found on more skillfully made thermometers that blood temperature was 98.6 degrees and not 100 as originally thought.

Some interesting temperatures on the Fahrenheit scale are shown in table herewith.

Lowest theoretically possible	–459.5
Lowest measured and obtained	–458
Salt and ice mixture	0
Water freezes	32
Water boils	212
Dull red heat, visible in dark	750
Red heat	1250
Oil burner flame, furnace	2600
Electric arc	6000

There seems to be no limit to temperatures measured in the sun which go up to many thousand degrees.

Between ice and boiling water at sea level are 180° F. The Centigrade scale is based on these two reference points, respectively, and marked 0° and 100° C. Thus the relative value of the two scales is $\frac{100}{180} = \frac{5}{9}$. Correcting for the lack of coincidence of the two zeros, the formulas for conversion are:

Fahrenheit degrees $= 32 + \frac{9}{5}$ Centigrade degrees.

Centigrade degrees $= \frac{5}{9}$ (Fahrenheit degrees $- 32$).

The Centigrade scale is used in all but English-speaking work and in all scientific work the world over. The Fahrenheit scale is used in domestic and engineering work in the English-speaking countries only. Thus, in our work we use this scale.

We know that heat is a condition that can flow from one material body to another only in accordance with the law that heat flows from that body having the higher temperature and into that body having the lower temperature. There has never been any exception to this general law. Like any liquid which must run down the gravity hill, heat flows down the temperature hill.

Furthermore, when heat drains out of a body, the temperature of that body is lowered; and, when it flows into a body, the temperature of that body is raised. All matter may be considered as a reservoir, with the capacity for storing or containing heat, depending upon (a) its size or weight, (b) the temperature to which it is raised above the surrounding area; and (c) the amount of temperature rise for each unit of heat added. This varies with different kinds of matter.

Some kinds of matter require that a great deal of heat be poured into a unit weight to raise the temperature one degree, other kinds will have a rapid rise in temperature with a relatively small amount of heat poured in. This characteristic of matter is called specific heat. It is measured by the amount of heat required to raise a unit weight of matter one degree temperature.

The unit of heat is taken as the amount of heat required to raise a pound of water one degree Fahrenheit. This unit is called British thermal unit or Btu.

In as much as the heat unit is based on water, obviously the specific heat of water is one or unity, and also the specific heat of any substance expresses its capacity to absorb heat as a ratio or decimal with respect to the similar capacity of water. Thus, the specific heat of copper being .0928, it holds less than one-tenth the heat that water does and the amount of heat which will raise one pound of water one degree Fahrenheit, 1 Btu, will raise over 10 lbs. of copper one degree or one pound over 10 degrees.

Some interesting specific heats are found in the following tabulation, Btu per pound per degree Fahrenheit:

Gases	
Air	.2377
Carbon Dioxide	.2025
Helium	1.25
Hydrogen	3.409
Oxygen	.2175
Steam	.5 to .7

Liquids	
Petroleum	.511
Gasoline	.5
Water	1.00
Alcohol	.548
Linseed Oil	.5
Turpentine	.411

Solids	
Asbestos	.195
Carbon	.126
Concrete	.156
Glass	.16
Ice	.465
Sand	.19
Wood	.3 to .7

Metals	
Aluminum	.226
Copper	.0928
Gold	.0323
Iron	.0297
Mercury	.0333
Silver	.0557
Zinc	.0931
Nickel	.0589
Tin	.0548

(Page 65, please)

Glass tarpaulin on launch

Fiberglas-Equipped Fishing Cruiser

Equipped with many "firsts" which make it the world's safest and most modern sport vessel, the recently launched fishing cruiser Wego is ready to be turned over to its owner, Powel Crosley, Jr., of Cincinnati, president of the Crosley Radio Corporation and owner of the Cincinnati Reds.

Designed by John H. Wells, Inc., New York naval architects, and built at the yards of Julius Petersen at Nyack, N. Y., the Wego is diesel-powered and has an overall length of 61 feet, a beam of 16 feet and a draft of four feet two inches.

Insulation Throughout Is Fiberglas

The Wego's hull, decks, refrigerated spaces, engine compartment and crew's quarters are all insulated with Fiberglas, a product of the Owens-Corning Fiberglas Corporation, Toledo, Ohio. This insulation will make the vessel more comfortable for both summer and winter cruising because of the low heat capacity and high heat resistance of Fiberglas.

The lounge of the cruiser is very comfortable and cool even though it is directly over the twin Kermath 160 hp diesel engines and the Exide batteries which power the yacht. Practically no heat comes from the engines to either the pilot house, which is aft of them, or to the staterooms, galley or lounge.

The pilot house of the Wego also should be cool in the hottest weather because the roof, which covers the main portion of the aft section, is insulated with Fiberglas.

The Wego is the first fishing cruiser to have all its curtains made of Fiberglas. The six large windows in the lounge are draped with a grey, scallop shell pattern and backed with a dull grey, unpatterned fabric, the two sewn together so that no further backing material is needed. The windows in staterooms, toilet rooms, crew's quarters and galley also have Fiberglas curtains. Shower curtains throughout also are of this new fabric material.

Fiberglas Tarpaulin Is Important Innovation

The light tan Fiberglas tarpaulin, which covers the utility launch, is the first use of this new material as a tender cover. It fits tightly over the power boat and is so divided that it can be removed quickly and replaced just as quickly. The material is lighter in weight than canvas and shines brightly in the sun.

The launch cover was made by William Fuller, Inc., City Island, New York City, from material coated by the Columbus Coated Fabrics Company, Columbus, Ohio. About 15 yards of Fiberglas cloth was necessary for the tarpaulin.

Close-up of Fiberglas tarpaulin

The new Fiberglas material also has been used in much of the electrical equipment on the Wego. The Crosley refrigerator in the galley is Fiberglas insulated as are the range and water heater.

Underwater Exhaust Gives Complete Silencing

The McLachlan underwater exhaust system on the Wego provides complete exhaust silencing and an effective means of exhaust gas disposal. This virtually eliminates the annoyances and discomforts generally experienced in small vessels powered by heavy oil engines.

The photoelectric pilot makes pos-

sible automatic steering and eliminates drudgery at the wheel. When visibility is poor, this pilot is declared to provide exacting "on course" travel and does a better job of steering than an expert can do by hand. This device is distributed in the East by Smith-Meeker Engineering Company, New York.

The Kermath diesel engines have Upton reverse and reduction gear. A closed cooling system enables the engines to work at maximum efficiency all the time. The Upton gear is a constant mesh transmission. A 100 per cent reverse and a positive neutral are features of this gear. Bendix controls from the bridge allow for fool-proof one-man operation.

The Wego's cruising speed will be 14 mph. Its fuel capacity is ample at the cruising speed for a radius of 750 miles. The power for the electric auxiliaries is supplied by a 3 kw Universal generator, with an oversize 750-watt generator on each main engine. The hot water heat to all cabins, as well as for galley and lavatories, is supplied by a three-way system deriving its heat from the main engine and auxiliary exhausts, as well as from an independent hot water heater.

STEADY AS YOU GO!

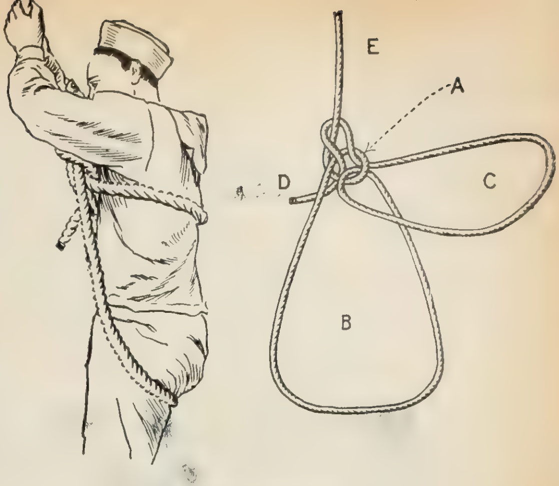
(Continued from page 61)

used in handling cased and packaged cargo or cargo in sacks. When the platform is fitted with skids, and used in connection with lift trucks, these slings form the most economical means yet devised for handling mixed cargoes into and out of holds and on docks.

Slings of special types for special purposes have been devised and made up specially by smart seamen ever since man first began to use rope aboard ship. One such is the bosun's chair. Another is the familiar parbuckle for rolling casks or spars up a steep incline.

Another very useful one-man sling is known as the French bowline. It is shown in the illustration and is thus described by Felix Riesenberg in his "Seamanship Studies for Young Officers," a series of lessons prepared for the United States Maritime Service: "This bowline is formed in the same fashion as the regular bowline except that the end (D see illustration) instead of going about the standing part (E) at once is given a round turn about the bight of the gooseneck (A) and then the knot is finished off as before.

"This leaves two loops that are loosely connected through the gooseneck. These loops are made so that a man can sit in one (B) while the other (C) goes under his armpits, the knot being at his breast. The weight of the man pulls the armpit loop taut. He is safe against falling out and is held upright, even if unconscious."



The French bowline

Deck Officers' Licenses for May

Name and Grade	Class	Condition
PORTLAND		
G. R. Roshcaln, Master	SS & MS, any GT	RG
SAN FRANCISCO		
C. Heil, Master	SS, any GT	RG
E. C. Miller, Master	SS, any GT	RG
K. I. Davis, 2nd Mate	SS, any GT	RG
A. C. Erickson, 2nd Mate	SS, any GT	RG
M. B. Smith, 2nd Mate	SS, any GT	O
E. N. Webster, 2nd Mate	SS, any GT	O
R. W. Daly, 2nd Mate	SS, any GT	O
W. G. Mehl, 3d Mate	SS, any GT	O
A. W. Hunter, 3d Mate	SS, any GT	O
K. M. Westdyke, 3d Mate	SS, any GT	O
F. J. Peterson, 3d Mate	SS, any GT	O
R. I. Clayton, 3d Mate	SS, any GT	O
R. W. Owens, 3d Mate	SS, any GT	O
B. Schloenleber, 3d Mate	SS, any GT	O
J. A. Cleborne, 3d Mate	SS, any GT	O
H. A. Flood, 3d Mate	SS, any GT	O
J. P. Anderson, 3d Mate	SS, any GT	O
SAN PEDRO		
F. R. Brizius, 3d Mate	SS, any GT	O
SEATTLE		
W. W. Henshaw, Chief	SS, any GT	RG
A. R. Akesson, Chief	SS, any GT	RG
J. D. Penny, 2d Mate	SS, any GT	O
C. O. Bouse, 3d Mate	SS, any GT	O

Abbreviations: SS is steamship; MS is motorship; GT is gross tonnage; O is original license; RG is raise of grade. All of these licenses are for ocean service.

PROBLEMS ANSWERED

(Continued from page 63)

Note that with the exception of the two lightest gases known, hydrogen and helium, nothing has as high a specific heat as water. Thus, water is a very effective cooling agent. A tank full of water at a given temperature will contain more heat than any other substance, weight for weight, except hydrogen and helium. There is a great deal more heat in the water in a boiler than in the steam in the boiler because of both the greater weight and greater specific heat. It takes much less heat to warm up ice than it does water. Thus, we have a real meaning to the often used expression "heat content." This must not be confused with the term "heat equivalent," used in connection with fuels where it is used to indicate the amount of heat in Btu released by a pound of fuel undergoing combustion. Thus, the specific heat of petroleum is .511, *i.e.*, a little more than ½ of a Btu is required to raise one pound one degree F. But, if oxygen is added and ignition temperature reached, a pound of petroleum will release 18,600 Btu. Its specific heat is .511, its heat equivalent is 18,600 Btu.

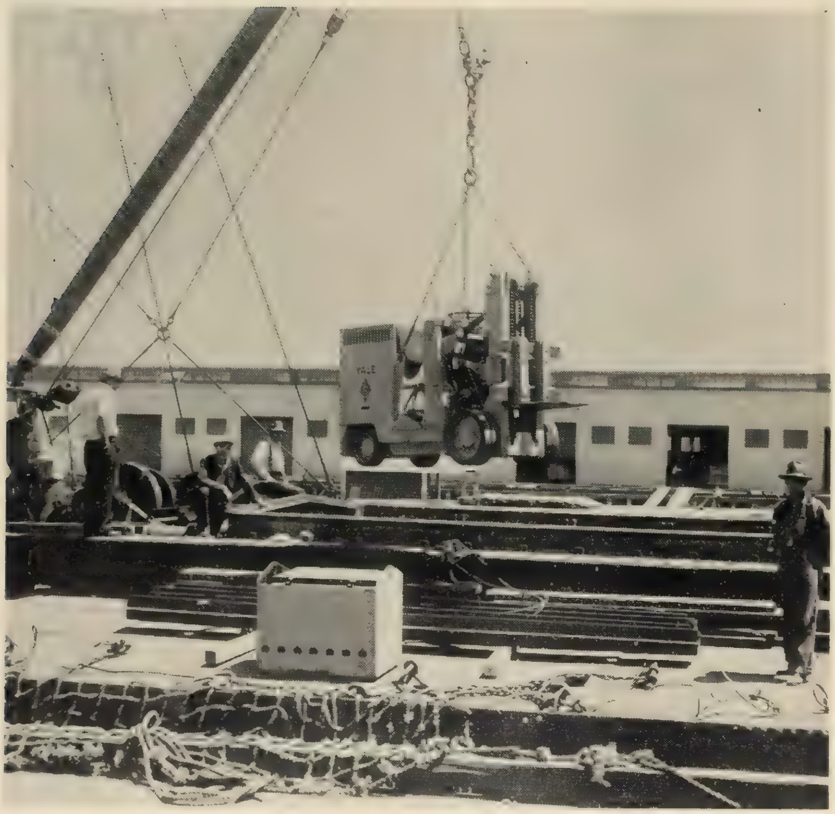
Our next article will continue with the characteristic of heat.

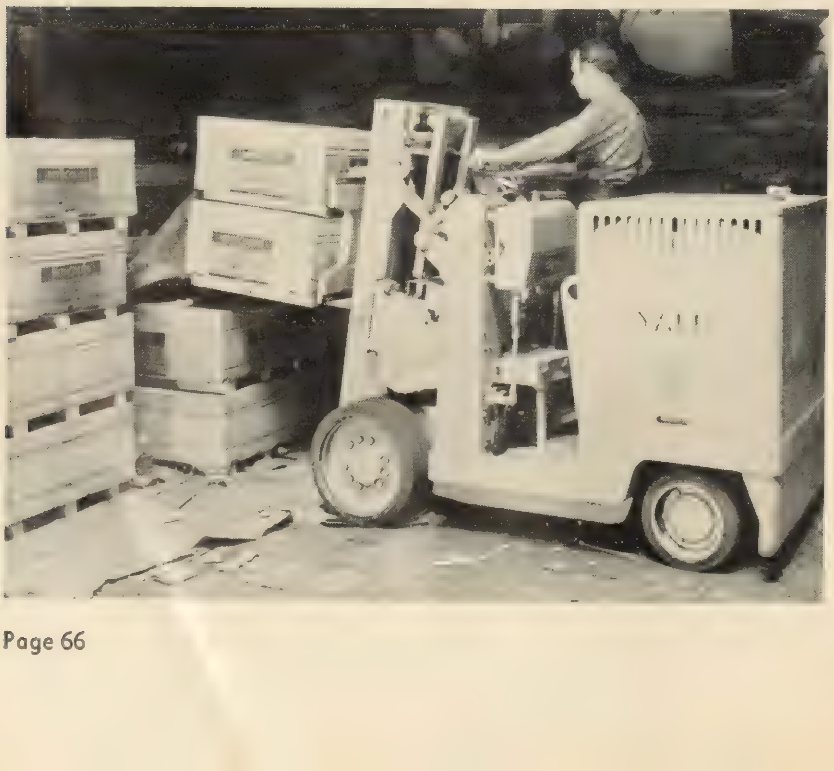
Engineers' Licenses for May

Name and Grade	Class	Condition
PORTLAND		
F. C. West, 1st Asst.	MS, any GT	O
W. G. Trueman, Chief	MS, 750 GT	O
2nd Asst.	MS, any GT	O
SAN FRANCISCO		
R. Barker, Chief	SS, any GT	RG
J. G. North, Chief	SS, any GT	RG
J. Sosa, Chief	SS, any GT	RG
W. N. Hornberger, Chief	SS, any GT	RG
G. Weismiller, Chief	SS, any GT	RG
R. A. Erner, 1st Asst.	SS, any GT	RG
H. C. Cox, 1st Asst.	SS, any GT	RG
D. R. Malone, 1st Asst.	SS, any GT	RG
F. G. Klein, 1st Asst.	SS, any GT	RG
M. F. Barwald, 1st Asst.	SS, any GT	RG
G. Thompson, 1st Asst.	SS, any GT	RG
W. N. Kahalekai, 2nd Asst.	SS, any GT	O
J. O. Tracy, 2nd Asst.	SS, any GT	O
J. B. Weil, 2nd Asst.	SS, any GT	O
K. G. Soderlund, 2nd Asst.	SS, any GT	RG
H. A. Merrill, 2nd Asst.	SS, any GT	RG
J. W. Richards, 2nd Asst.	SS, any GT	RG
F. J. Walton, 2nd Asst.	SS, any GT	RG
B. Bootes, 3d Asst.	SS, any GT	O
W. C. Folden, 3d Asst.	SS, any GT	O
A. E. Max Gilgan, 3d Asst.	SS, any GT	O
G. B. Fernandez, Chief	MS, any GT	O
L. Rasmussen, Chief	MS, any GT	O
C. Shore, Chief	MS, any GT	O
M. Gonsalves, Chief	MS, any GT	O
G. C. Martin, Chief	MS, any GT	O
L. G. Steven, Chief	MS, any GT	O
C. Owens, Chief	MS, any GT	O
H. E. Morgan, 1st Asst.	MS, any GT	O
SAN PEDRO		
W. A. Stephensen, 2nd Asst.	SS, any GT	RG
E. M. Zeller, 2nd Asst.	SS, any GT	RG
H. L. Sells, 3d Asst.	SS, any GT	O
SEATTLE		
A. A. Carlson, 2nd Asst.	SS, any GT	RG
R. L. Prentice, Chief	MS, any GT	O
J. K. McDonald, Chief	MS, any GT	O
C. E. Lanktree, Chief	MS, any GT	O
J. P. McGinnis, Chief	MS, any GT	O
J. E. Sullivan, Chief	MS, any GT	O
F. G. Clark, Chief	MS, any GT	O
J. W. Bean, Chief	MS, any GT	O

Abbreviations: SS is steamship; MS is motorship; GT is gross tonnage; O is original license; RG is raise of grade. All of these licenses are for ocean service.

Yale Trucks Clear the Hold





Unloading heavy packages of sheet steel and tin plate from ship's hold to pier and then into the pier shed became an easy matter through the use of Yale Center Control Electric Fork Trucks, recently placed in operation at Los Angeles and San Francisco by the Associated Banning Company.

The job, illustrated herewith, consisted of unloading tons of BethColite Tin Plate from the Calmar liner Oakmar at Pier 48A. First, the Yale Truck is slung into the ship's hold, followed by the battery and counterweight, which had been removed to keep the total load within the capacity of the ship's sling.

In a few minutes, the battery and counterweight having been replaced, operations begin. The truck, operating in the cramped quarters of the hold, maneuvers the packages, two at a time, to the center of the hold, where they are picked up by the ship's sling and hoisted to waiting trailers on the platform. A tractor hauls them into the warehouse, where they are unloaded by another fork truck, freeing the trailers to repeat the cycle.

The job works with clock-like precision, and in a very short time the huge stacks of tin plate packages in the warehouse indicate that the ship's hold is about empty of its heavy cargo.

This 3-ton capacity Yale Fork Truck is one of three recently purchased by the Associated Banning Company for unloading sheet steel and tin plate at Los Angeles and San Francisco Bay ports. In the San Francisco Bay region, the truck usually is left on board ship while it discharges cargo at the various ports.

A feature of this truck is the center control. The placing of the operator in the middle of the chassis frame gives him a safe and protected position with perfect visibility in all directions. The increased wheel base provides improved load distribution, and the short overall length of the truck makes possible operation at right angles in the narrowest aisles, adding to the speed and flexibility, and making this unit invaluable in storage and warehouse use. The trucks give continuous service by the use of spare batteries.

On the Ways -

SHIPS IN THE MAKING

LATEST NEWS FROM AMERICAN SHIPYARDS

Commission Takes Bids On Tugs and Coasters

The Maritime Commisison has asked for bids on two types of harbor tugs and one type of small cargo vessel known as a coaster.

One type of harbor tug will be powered by coal-burning compound steam reciprocating engines and will have approximately 1000 horsepower. With an overall length of 109 feet and beam of 27 feet, it will have a single screw.

The other harbor tug design provides for diesel electric propulsion with one or two generators driving through a single screw. Oil burning, it will have an overall length of 105 feet and a beam of 25 feet. This design will vary from the customary tug design used in this country in that its towing bitts and towing machine will be located closer to midship than is the customary commercial practice. It is felt this will give increased maneuverability while handling a tow.

The coaster will be a small freight ship of about 2800 tons deadweight with a speed of approximately 10½ knots. It will be 258 feet, nine inches overall, beam of 42 feet, one inch and draft of 17 feet, 11 inches. It will be coal-burning with reciprocating steam engines and single screw propulsion. The dimensions of the coaster will permit it to pass through the Welland Canal.

Contractors may bid on from one to six tugs, but not more than six tugs will be awarded to a single yard or plant. Contractors may bid on from one to nine coasters, but not more than nine coasters will be awarded to one yard or plant.

The Commission expects to receive bids on these vessels from a number of yards which do not have facilities for building the large vessels of its regular and emergency programs. The expected bidders are located on all three coasts, on the Great Lakes and on some of the larger rivers.

Bids will be received until 12 noon, July 8, 1941, and will be opened at 12:15 p. m. E.S.T. the same day in Room 7856, Department of Commerce Building, Washington.

Coast Guard Opens Bids on Cutters

Bids were opened at Coast Guard Headquarters on June 20, for the construction of from one to ten 73 foot cutters. These cutters will be of the same class as the Oleander which was recently launched at Jeffersonville, Indiana.

The apparent low bid was made by the Missouri Valley Bridge & Iron Co., of Leavenworth, Kansas, with a fixed price of $64,450 for each of four cutters. The low bid on from 5 to 10 cutters was made by the St. Louis Shipbuilding and Steel Co., of St. Louis, Missouri with fixed prices of $83,000 for each of five cutters, $82,300 for each of six cutters, $81,800 for each of seven cutters, $81,300 for each of eight cutters, $81,000 for each of nine cutters, and $80,800 for each of ten cutters.

In all, eight companies submitted bids, the others being: Petersen & Hacker, Ltd., Blair, Nebraska; Gray's Iron Works, Inc., Galveston, Texas; Port Houston Iron Works, Houston, Texas; Madison Marine Ways, Madison, Indiana; M. L. Gilbert, Jacksonville, Florida; and the Union Iron Works, Inc., New Orleans, Louisiana. Most of the companies submitted both fixed price and adjusted price bids.

The cutters will be twin screw steel vessels, 73 feet in length, with a displacement of 78 tons, and engines of 300 shaft horsepower. They will be specially constructed for maintaining navigational aids and for performing emergency duties in time of flood on the Western rivers.

Recent Launchings

The SS Alcoa Pennant, a C-1 cargo vessel of 9290 deadweight tons, was launched June 26 at the yard of the Consolidated Steel Corporation, Los Angeles, California. The sponsor was Miss Carol M. Steinle, daughter of F. P. Steinle of the Los Angeles staff, Aluminum Company of America, operator of the ship. (Full description and pictures on page 34 this issue.)

The SS Extavia, a modified design of a C-2 cargo vessel of 7550 deadweight tons, was launched June 28 at the yard of the Bath Iron Works, Bath, Maine. Sponsors were Mrs. Leland S. Andrews and Miss Maureen Elinore Andrews, wife and daughter of the operating manager of American Export Lines, Inc., operator of the ship.

The SS President Polk, a C-3 passenger-cargo vessel of 9937 deadweight tons, was launched June 28 at the yard of the Newport News Shipbuilding and Dry Dock Company,

(Page 69, please)

Built, Building and Ordered

May 31, 1941
Long-Range Program

Passenger	1
C-1 Cargo	52
C-2 Cargo	82
C-3 Cargo	77
C-3 Passenger and cargo	18
Cargo ships (special)	18
Passenger & cargo ships (special)	6
Tankers	23
Army transports	2
Navy transports	2
Seaplane tender	1
Destroyer tender	1
Subtotal	283

Emergency Program
January, 1941

EC-2 Cargo	200
Subtotal	200

Defense Aid Program
April, 1941

EC-2 Cargo	112
C-1 Cargo	10
C-2 Cargo	22
C-3 Cargo	6
Tankers	72
Subtotal	222
GRAND TOTAL	705

Other Merchant Ship Production

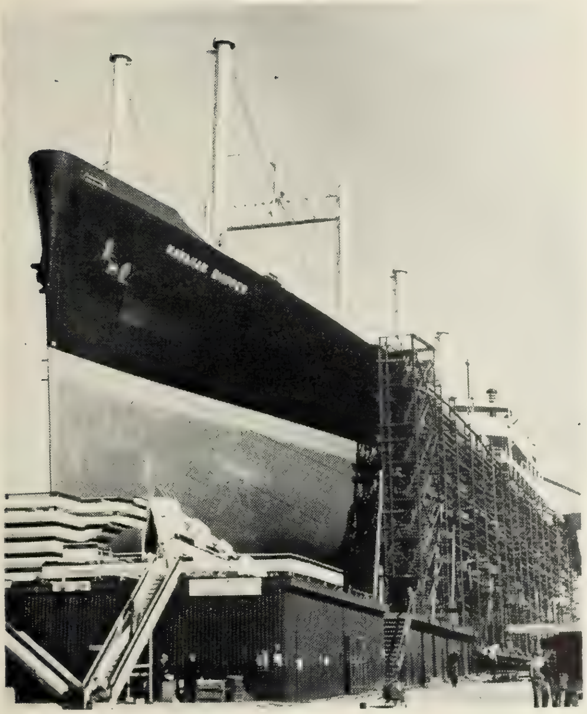
British Government	60
Private Account	86
Total Merchant Ships, Built, Building or Ordered	851
Deliveries to May 30, 1941	86
Total building or ordered in the United States	765

American Shipbuilding By Types and Yards at a Glance

SHIPYARDS IN THE UNITED STATES BUILDING OCEAN-GOING VESSELS FOR THE MARITIME COMMISSION
SHOWING NUMBER AND TYPE OF SHIPS BUILT, BUILDING OR UNDER ORDER IN EACH YARD

	C-1	C-2	C-3	Tankers	EC-2	Others	Total
	Atlantic Coast						
Bath Iron Works Bath, Maine						4	4
*Bethlehem-Fairfield Shipyard, Inc. Baltimore, Maryland					62		62
Bethlehem Steel Co., Fore River Plant Quincy, Massachusetts						8	8
Bethlehem Steel Co., United Plant Staten Island, New York	5						5
Bethlehem Steel Co., Sparrows Point Baltimore, Maryland	5			9		12	26
Federal Shipbuilding & Dry Dock Co. Kearny, New Jersey	5	47	6	3			61
Newport News Shipbuilding & Dry Dock Co. Newport News, Virginia		4	7	3		1	15
*North Carolina Shipbuilding Co. Wilmington, North Carolina					37		37
Pusey & Jones Corp. Wilmington, Delaware	12						12
South Portland Shipbuilding Corp. South Portland, Maine					16		16
Sun Shipbuilding & Dry Dock Co. Chester, Pennsylvania		24	8	80			112
Atlantic Coast Total	27	75	21	95	115	25	358
	C-1	C-2	C-3	Tankers	EC-2	Others	Total
	Gulf Coast						
Alabama Dry Dock & Shipbuilding Co. Mobile, Alabama					13		13
*Houston Shipbuilding Co. Houston, Texas					37		37
Ingalls Shipbuilding Corp. Pascagoula, Mississippi			21				21
*Delta Shipbuilding Co., Inc. New Orleans, Louisiana					25		25
Pennsylvania Shipyards, Inc. Beaumont, Texas	12						12
Tampa Shipbuilding Co., Inc. Tampa, Florida		8					8
Gulf Coast Total	12	8	21	0	75	0	116
	C-1	C-2	C-3	Tankers	EC-2	Others	Total
	Pacific Coast						
Bethlehem Steel Co., Union Plant San Francisco, California	5						5
*California Shipbuilding Co. Los Angeles, California					55		55
Consolidated Steel Corp. (Craig Yard) Los Angeles, California	8					2	10
Moore Dry Dock Co. San Francisco, California		21	4				25
*Oregon Shipbuilding Co. Portland, Oregon					43		43
*Richmond Shipbuilding Corp. Richmond, California					24		24
Seattle-Tacoma Shipbuilding Corp. Seattle, Washington	5		34			2	41
Western Pipe and Steel Co. San Francisco, California	5		21			2	28
Pacific Coast Total	23	21	59	0	122	6	231
Grand Total	62	104	101	95	312	31	705

*Sites of existing shipbuilding organizations established for building emergency vessels.



Hawaiian Shipper ready for launching at the Federal Shipbuilding & Dry Dock Co. yard, Kearny, New Jersey

"NIKELADIUM ALLOY" *Steel* FLANGED FITTINGS

Manufactured to A.S.A. Standards B16E—1939
Steel Specification ASTM A157-C1

Manufactured of Carbon Moly Steel with tensile strength of *90,000 lbs. per square inch.* Tested to three times the stated working pressure —metal thickness from ¼" to ½" over specifications.

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Newport News, Virginia. The sponsor was Miss Patricia Kennedy, daughter of Joseph P. Kennedy, former United States Ambassador to Great Britain and former chairman of the United States Maritime Commission. The ship will be operated by the American President Lines.

The SS African Comet, a C-3 passenger-cargo vessel of 10,230 deadweight tons, was launched June 28 at the yard of the Ingalls Shipbuilding Corporation, Pascagoula, Mississippi. The sponsor was Miss Mary Maud Farrell, daughter of Mr. John J. Farrell, Chairman of the Board of the American South African Line, which will operate the ship, and granddaughter of James A. Farrell.

These ships brought to 119 the number launched in the Commission's 500-ship, long-range program, of which 93 have been delivered to date.

Designated EC-2

Official designation of the 312 emergency program ships, being built for the Maritime Commission as part of the National Defense and Aid-to-Britain effort, as the EC-2 type, was announced by the Commission. Those which are to be operated under the American flag will be known, the Commission stated, as the "Liberty Fleet."

The designation is derived from the fact that the ships are specially designed for rapid emergency construction, and are cargo vessels in the class between 400 and 450 feet long.

The first emergency program called for the construction of 200 of these ships and 112 more are under contract as part of the President's order for 212 vessels of various types to be constructed for transfer to Great Britain under the loan provisions of the Lend-Lease Act.

Pennsylvania Shipyard Launches Cape Hatteras

Cape Hatteras, a cargo motorship of 5028 gross tons was launched on Saturday afternoon, June 14, at the yards of the Pennsylvania Shipyard, Inc., Beaumont, Texas.

The sponsor was Mrs. Daniel S. Brierley, wife of the director of the Maritime Commission's Division of Maintenance and Repairs. Mr. and Mrs. Brierley, with their 13-year-old daughter Honora Anne Brierley, flew down from Washington to attend the launching.

Cape Hatteras is a C-1 type cargo vessel designed by the Commission's Technical Division, of which 62 have been ordered. It is the 113th ship launched of which 91 have been delivered to date in the 500-ship long-range program of the U. S. Maritime Commission.

Deaerators For Sinclair Tankers

Each of the Sinclair Refining Company's six new tankers being built by the Bethlehem Steel Company will be equipped with a Cochrane marine deaerator of atomizing design.

Four of these units will have a maximum deaerating capacity of 60,000 lbs. per hour, taking boiler feed at

175° F. Two other units are of 80,000 lbs. per hour capacity.

The design of the Cochrane marine deaerator permits the use of shells of various shapes to meet exacting space restrictions. There are the additional advantages that great flexibility in arrangement of accessory equipment and wide latitude in location of openings are afforded. The principle of deaeration by atomization was developed expressly for shipboard use and insures removal of dissolved oxygen regardless of roll, pitch or list of the ship.

Bethlehem Launches S. S. Robin Sherwood

Another new American vessel for the South African trade was launched at the Sparrows Point Yard of Bethlehem Steel Company, Shipbuilding Division, Saturday, May 17, at 12 noon.

The keel for this ship was laid on October 10, 1940, she being one of six vessels under construction at this yard for the Robin Line of Seas Shipping Company, Inc., New York City. The new hull was christened Robin Sherwood by Mrs. Frank V. Barns of Mt. Kisco, New York, wife of the secretary and attorney for Seas Shipping Co.

Robin Sherwood will have a deadweight capacity of about 9700 tons, a displacement of 15,084 tons, and a cargo space of about 600,000 cubic feet, of which 16,800 cubic feet is refrigerated. Her principal dimensions are as follows:

The good steamer Robin Sherwood slides down the ways at Sparrow's Point

Length overall	479′8″
Length between perpendiculars	450′
Beam	66′
Depth	43′
Depth to second deck	34′
Draft loaded	27′
Sustained sea speed	15½ knots

Especially designed for the South African trade by George Sharp, naval architect, she is of the shelter deck type with a raised forecastle, and has four decks in No. 1 hatch; three decks in No. 2, No. 3 and No. 4; and two decks in No. 5.

Hatch No. 1 is 20′ x 20′. All other hatches are 24′ x 36′. All hatches are quadruple rigged, except No. 1 and No. 5 which are double rigged.

There are sixteen 5-ton booms, a 30-ton heavy-lift boom at No. 3 hatch and a 10-ton boom at No. 5. The 45 hp electric winches are all on raised platforms to increase the operator's vision and efficiency.

All ventilation throughout the ship is mechanical, with a three-minute change of air in living quarters and a five-minute change in cargo spaces. Coupled to the mechanical ventilation is a Cargocaire system. This new system dehydrates the air circulated in the holds and thus prevents moisture damage to cargo.

All holds, cargo compartments, as well as decks, are completely free of pipes, leads and stanchions, except the main stanchion amidships at the fore and after ends of each hatch. Holds, masts and kingposts are fitted with permanent lighting fixtures to facilitate handling of cargo at night.

There are four Carrier-equipped refrigerator compartments, each with a capacity of 4200 cu. ft. These spaces can be maintained at any temperature between 5° and 50° F.

The propulsion machinery consists of a Bethlehem cross-compound turbine of 6300 shaft horsepower driving through General Electric double-reduction gears, a single four-blade propeller at 85 rpm. The two Babcock and Wilcox water tube boilers, burning oil under a forced draft with Bailey combustion control, will supply steam at 450 lbs. per square inch pressure and a temperature of 750° F. Electric current will be supplied by two 300 kw General Electric turbo generators, with a 10 kw Hill-Westinghouse unit supplying power in emergencies. The vessel can either be steered manually or by Sperry automatic steering device. The rudder is of the contraguide, unbalanced type which minimizes resistance and increases the speed of the vessel.

The navigation equipment includes a Sperry Gyro compass, regular magnetic compasses, electric fathometer, electric course recorder, rudder angle indicator and revolution counter.

The Mackay radio equipment includes a long-wave, a short-wave and an auxiliary transmitter, an all-wave length receiver, a radio direction finder and an auto alarm for receiving SOS messages when the operator is not on watch. In case of emergency, the power for operating the radio equipment, which is normally furnished by the main generators, can be supplied by emergency batteries.

This vessel is equipped with two 28-foot lifeboats, each of which is large enough to carry 60 persons and is fitted with Fleming hand-propelling gear which does away with the old-fashioned rowing with oars.

Modern and comfortable quarters, conforming to the latest requirements and practice, have been provided for the fifteen officers and twenty-seven crew members.

Accommodations are provided for twelve passengers in duplicate groups of two double and two single rooms, all with baths, clustered about a pair of spacious enclosed verandas looking out upon the sea. The veranda arrangement, which was originated by Mr. Sharp, makes every stateroom an out-

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side room and provides a means of cross ventilation, which is especially appreciated on tropical runs. Separating the verendas amidships is a spacious dining saloon, its ceiling three feet above the boat deck level; an innovation providing additional light and ventilation from above.

Upon completion, the Robin Sherwood will be operated in the Robin Line's regular service between the American ports of New York and Baltimore, and the South and East African ports in the Cape Town-Mombasa range. The speed of the new vessel is such that they will turn around once every three months, whereas the older vessels presently engaged in this trade require four to five and a half months to complete the round trip.

A complete illustrated description of Robin Locksley, first of these six Robin Line ships to be delivered, was published in the May issue of PACIFIC MARINE REVIEW.

Upper Air Soundings Aboard Ship

At the request of the United States Weather Bureau, American Export Lines has agreed to equip each of its transatlantic passenger vessels with radio sondé equipment to facilitate the taking of upper air soundings over the Atlantic.

Radio sondé equipment consists of automatic recording and transmitting apparatus and certain other instruments that are carried aloft by helium-inflated balloons. Special receivers installed aboard the ships automatically receive and record instrument readings transmitted in code from the sondé as it ascends to various altitudes.

The steamship company has agreed to make the necessary deck installations at its own expense and to transmit the weather soundings to the U. S. Weather Bureau for use in analyzing and forecasting weather over the mainland, as well as over the ocean.

This new equipment will be operated by American Export Line's meteorologists, who have been permanently assigned since last October to make each crossing on the company's passenger vessels.

This is said to be the first time that radio sondé equipment has been installed on United States merchant vessels.

◆

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AMERICA'S SHIPBUILDING PROGRAM

(Continued from page 49)

ican yards for the British Purchasing Commission—that is, under direct order by the British government. Fourteen ways have been set up to build these ships, which differ from the EC-2 in that they will have steam supplied by three coal-burning Scotch boilers, instead of two oil-fired, water tube boilers, the desirability of this boiler equipment at this time in ships operating for the British being quite obvious.

The Commission's regular long-range program has also been stepped up so that its production is ahead of the originally-planned schedules. In fact, 26 new ways are being contracted at this time to build these modern-type, high-speed ships, making a total of 96 ways in United States yards to be utilized for that program.

Agreements have been reached recently with those yards to construct 195 new vessels of these standard types of which 53 will be C-3's, 46 C-2's, 24 C-1's and 72 oil tankers. These are in addition to the 174 ships of these types already under contract, many of which are now partially completed.

Very shortly there will be in full capacity operation building merchant ships in the United States a total of 29 yards with 186 ways. That is virtually a four-fold increase in four years.

There are now building in those yards, or committed for, 741 merchant vessels with a total deadweight carrying capacity of more than 8,000,000 tons. Production of 1,250,000 tons is expected in 1941, in 1942 about 3,000,000 tons, and in 1943, with other ships to be ordered, production in the United States, it is estimated will hit the 5,000,000-ton mark.

An idea of the magnitude of the immediate construction effort — the building of the 312 emergency ships, the 195 added ships in the long-range program and the 60 British emergency ships—may be gained from the fact that the hull steel requirements will be 1,670,000 tons. The requirements for these ships now building, other than those just mentioned, are 515,000 tons, making the total hull steel to be used reach a figure of 2,180,000 tons.

That is a somewhat sketchy picture of the shipbuilding phase of our nation's defense and aid to the democracies program—the "all-out effort" for which President Roosevelt has called, so far as the shipbuilders and the Maritime Commission are concerned. We are confident that it will be a vital factor in restoration of democratic security in the world—a victory for the free peoples of nations which will not tolerate aggression.

Excerpts from an address before the Society of Professional Engineers, Washington, D.C., June 16, 1941.

FASTEST FERRY FLEET

(Continued from page 52)

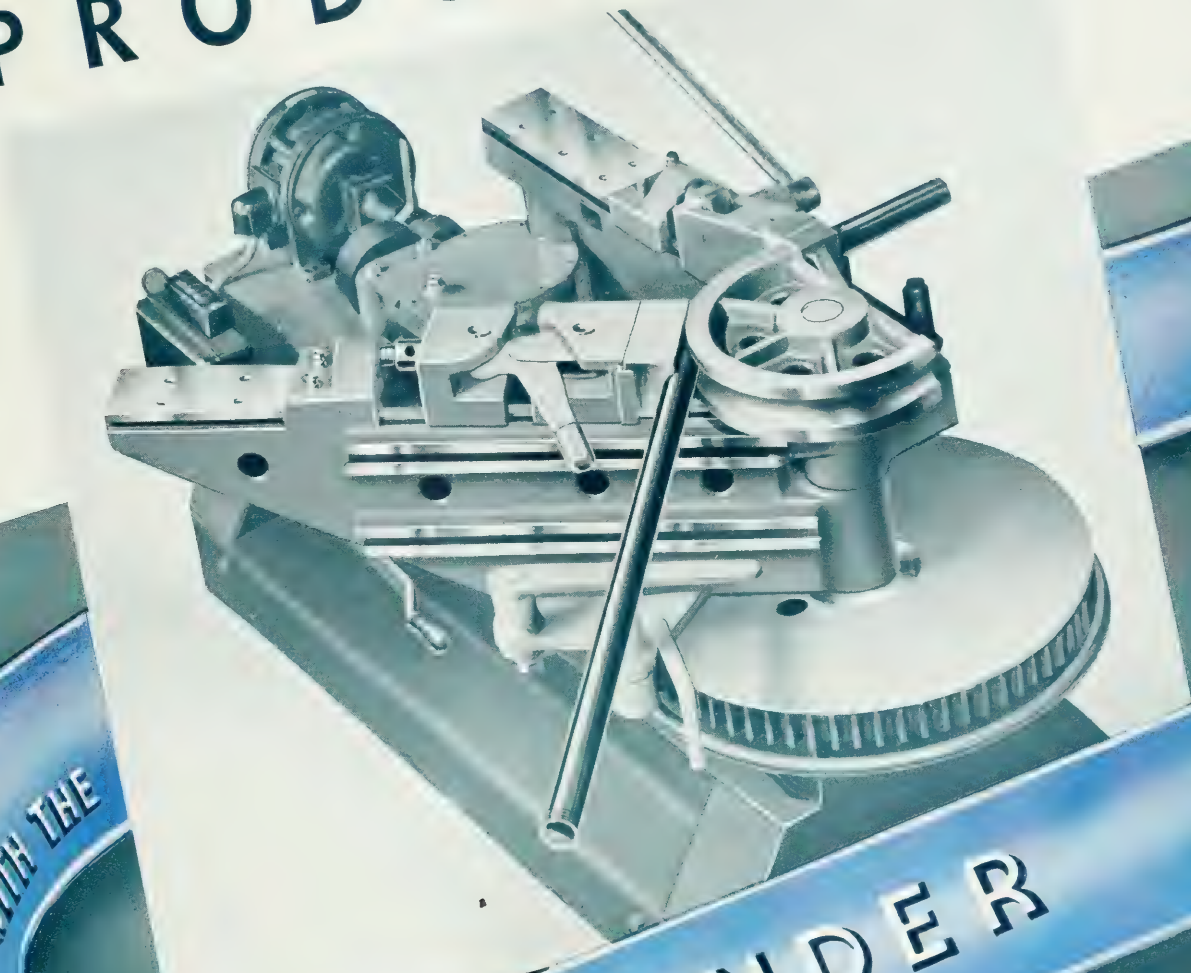
Boiler Works of Seattle, and supplies steam for heating and galley purposes. The fuel is also preheated by steam from the waste heat boiler. There is also a small Arco boiler as a standby for emergency purposes. Propulsion power from the main engines is applied through steel shafts to special 4-bladed Coolidge propellers with 9′ 11″ diameter by 8′ pitch for the Willapa, and 9′ 11″ diameter by 7′ 6″ pitch for the Enetai.

The auxiliary generating motor is a 6-DF-17 Busch-Sulzer with 13″ bore and 17″ stroke developing 450 hp at 360 rpm and operating two generators from one shaft, one an ac 25 kw and one a dc 150 kw. The generators, as well as the exciter, were made by the Elliott Co., Ridgway, Pennsylvania. The two generators were needed because the vessel has a considerable amount of dc equipment, including the steering gear. Starting air for the engines is supplied by a compressor furnished by Busch-Sulzer and operated by the auxiliary engine. There is also installed a Rix standby compressor, electrically operated. Sharples supplied the oil purifiers. Fire protection in the engine room is Lux automatic, furnished by Walter Kidde & Co. Portable Foamite extinguishers, together with fire pumps of large capacity, protect the passenger and automobile decks.

Danger from electrolysis of the steel hull or of tubes in the heat exchangers is prevented through an eliminator supplied by the Marine Electrolysis Eliminator Co. of Seattle.

SPEED-UP

PRODUCTION



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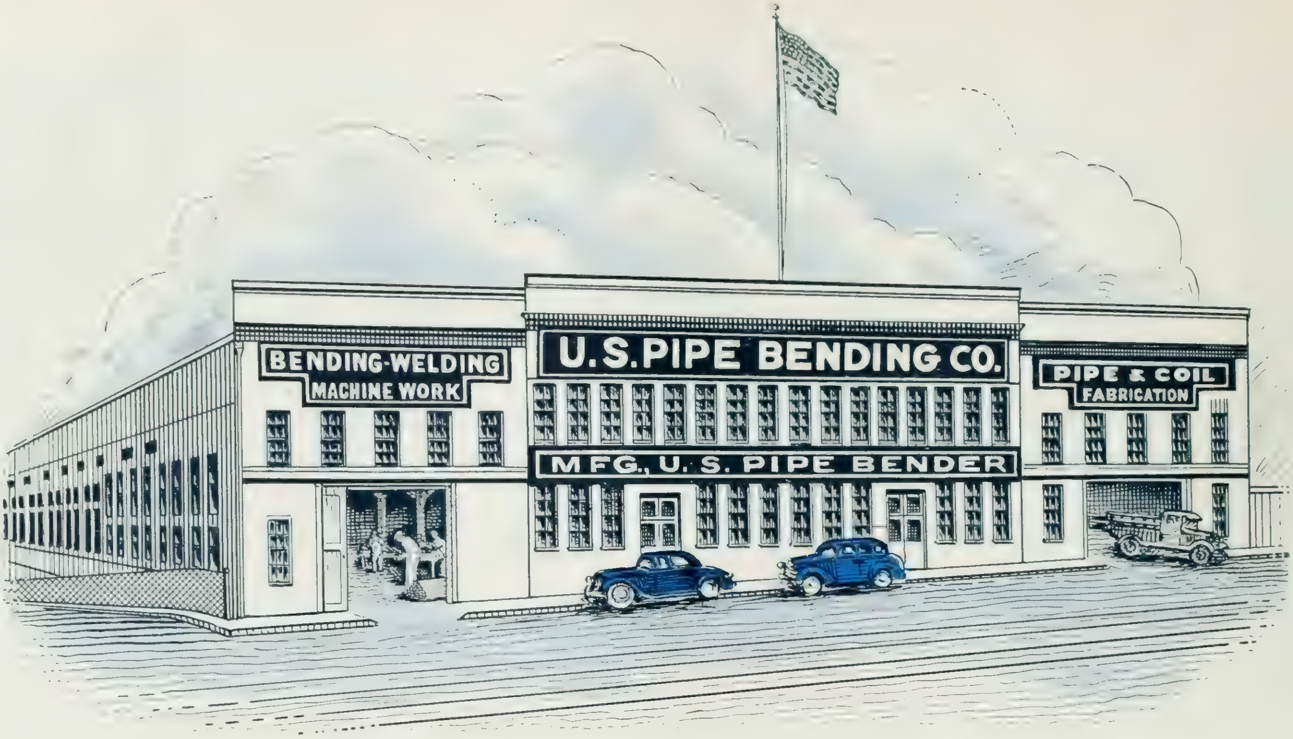

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Rather than permit these machines to fall into the hands of competitors in the fabricating lines, it has been the policy in the past to keep these machines off the market. However, the demand and actual need for these machines under the present defense program is so great that the company is reversing its stand and is again supplying them to the industries as it did during the last war.

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PMR *goes to the Bilge Club Field Day!*

cHose, J. R. Eidom, president of the Bilge Club; Tom Forster, Joe Barry, the champion!

by Paul Faulkner

Records fell on Palos Verdes June 21 when The Bilge Club of Los Angeles Harbor took over for the Twelfth Annual Cruise of S. S. Goodfellowship.

Four hundred and forty-four members and friends stormed the famous terrain at Palos Verdes Country Club setting a new mark for attendance; fixing a new high of 125 for participation in the golf; and to make the day repleter one of the boys tossed in a hole-in-one, with witnesses.

President John R. Eidom of The Bilge Club was general chairman for the great Field Day and Barbecue. Officers in charge of special events were:

GOLF—Charlie Houghton
BASEBALL—Jim Buntin
TUG OF WAR—John Marshall
TENNIS—Remington Mills

Winner of the Bethlehem perpetual golf trophy was Joe (Tubbs) Barry with a sensational card of 85-20-65; Joe romped home—if you call a photo finish with George Bankson a romp! George shot 80-15-65, but Barry was leaving the maiden ranks.

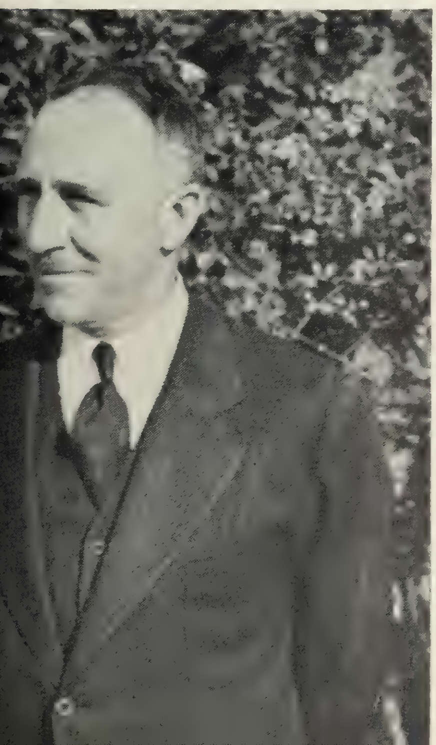
In the Class B division Jack Martin of the Los Angeles Harbor Department hit the tape with 99-35-64. He won the Brown Bros. perpetual trophy.

Jack Ferlin took careful aim on one of the 3-pars and arched the pellet into the hole—a really amazing and skillfully executed poke. Interviewed, Jack said: "'Twasn't nothin,'—I been practicing for this!"

There were 68 players in the Guest Flight. E. A. Jackson won first low net, with Al McCall second. Low gross went to Sherman Kunkel, Ralph Ring, second. In the Class B guest flight Joe Bagdanovich was winner with Terry Hickman next in line.

Carl Hald annexed the Bilge Club Class A singles tennis title. Class A doubles championship went to Gene Overton, president of the Board of Harbor Commissioners, and Fred Pique, secretary-treasurer of Keystone Shipbuilding Corporation.

Ed Marshall won the Class B tennis singles; while Remington Mills and Benny Caughlin captured the doubles.



George Sutherland turned in a net 68

In baseball two well-chosen teams battled fiercely . . . the "Pelicans" vs. "Gulls." The smoothly drilled "Gulls" marched in 14 to 1, but the loppy score doesn't convey the fight staged by the losing squad. Winning pitcher was Howard Hartry, and behind the plate stood Ed Kellenberger, he of Wilmington Tug Boat Company.

Raffle Prize Number 1 (they sure had lots of prizes, prizes for everything) found Captain S. F. Heim, USN, Port Captain for Los Angeles Harbor, winning a complete set of golf irons.

President John Eidom opened the twilight meeting at the barbecue pits, with all the boys gathered around resting from the strenuous Olympiad, thanking all the committeemen and the membership for making the day the success it was!

Sam Capello, Jack Logan

BILGE CLUB
LOS ANGELES HARBOR

FACING PAGE:

eft: A. G. Wilson, Dan Dobler, Walter ichards, Jr., Ed Ryan, Capt. Theo. W. eters, Bud Mersereau, Ray Goodspeed.

Right: Ray Sullivan, Mike Gavin.

eft: Bud Richley, John E. Marshall, Jim raig, Hampton Neergaard, Jim Buntin, illie Wickersham, Charlie Houghton, apt. Theo. W. Peters, Remmy Mills, ıck Malseed, J. R. Eidom, Joe Costello.

Right: Ted Scanlan, Red McDonald, Frank Cavanaugh, Fred Archibald, Capt. Tellicum (M/S Silver Ray), Oscar Lundin, Dan Dobler, Jake Lindemuth.

eft: Capt. Brown, Dan Sullivan, Al yers, Harry Summers, Bill Reuter, ıck Logan (right standing), Mr. Smith, . S. Holloway, Mr. Schaefer, Jim Buntin.

Right: Al Borah (standing), Duke Decker, Mr. Becker, Howard Lane, Ed Whittemore, Matt Soares, Jim Sullivan, Sammy Cappelle, Arch Eckdale.

eft: Eloi Amar.

Right: Charles Houghton, W. H. Wickersham.

•

Billie Wickersham, Ray Mitchell, Charles Houghton.

•

Ed Whittemore, Ed Kellenberger.

•

Doc. Stellar, Mickey Littlefield.

•

Jim Craig, Capt. Heim (USN), Lt. Husted, Leon Munson.

•

Who are the Winners!

"Nip" McHose, the M.C.

Baby Bottle Contest

House Flags!

Master-of-ceremonies for the prize awards was fiery John C. McHose, admiralty lawyer. Timely remarks came from W. H. (Billy) Wickersham who was Honorary General Chairman; he reviewed the history of the organization and commended the boys on their training and conditioning for the various events.

ORDER OF FINISH

Class A Golf—Members 0 to 20

Joseph H. Barry	85-20-65
George Bankson	80-15-65
Ray Mitchell, Jr.	89-19-66
Frank Parr	79-12-67
Walt Richards	89-20-69
Jack Malseed	79-10-69
E. Amar	83-14-69
George Messall	79-10-69
Ed Hannay	90-20-70
John Wehrman	87-17-70
Lee Munson	84-14-70
Charles Donnetti	86-16-70
Jim Craig	87-15-72
Joe Goss	81- 9-72
Walter Brown	86-14-72
John Nip McHose	80- 7-73
Al Johnson	91-18-73
W. H. (Billy) Wickersham	91-18-73
Don Montague	83- 8-75
D. R. Philips	95-20-75
A. F. Boro	100-18-82

INTO THE RECORD BOOK

Class B Golfers—Members 21 and up

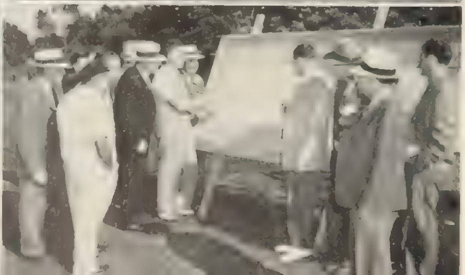
Jack Martin	99-35-64
C. G. Reed	89-22-67
George Sutherland	91-23-68
Otto Miller	92-24-68
G. H. Stewart	97-28-69
Arthur Pegg, Jr.	94-25-69
Paul Faulkner	99-29-70
Allan Bullard	96-26-70
George Pieper	99-28-71
Pete Hansen	93-21-72
Tom Cluff	112-40-72
J. E. Marriner	123-50-73
Dan Dobler	113-40-73
G. A. Reeve	97-24-73
Hugh Middleton	103-30-73
Ed Nichols	99-25-74
Nick Trutanick	101-27-74
E. L. Ryan	109-34-75
Norman Dunnavant	102-26-76
Robt. Sampson	108-32-76
E. R. Nelson	116-40-76
Ivor Bell	105-28-77
Charles Gardner	105-28-77
Lloyd Moore	118-40-78
Ray Mitchell	105-25-80
W. G. MacAdams	103-21-82
Arthur Eldridge	117-34-83
Fred Cordes	111-25-86
I. I. Henry	116-29-87
F. S. Gillette	113-22-91
Howard Wickersham	129-32-97

A 73 for "Billie" Wickersham

Bernie Caughlin, Carl Hald, Gene Overton, Fred Pique.

Ed Leighton, Art Pegg, Jr., driving first tee, Jack Morris, Jerry Scharer, with Arthur, Sr., in background at right.

John Craig, Capt. J. H. Willey, L. M. Eddy, Capt. V. J. Shaughnessy.


Charlie Houghton, gold tournament director, pointing to Joe Barry's sparkling net 65 which won the 12th running of The Bilgers Handicap. Joe burned up the course.

Hungry Athletes!

Ray Goodspeed, Joe Bush, Paul Faulkner, R. W. Gerhart, Tom Forster

Brother, can't you just smell those steaks!

Chief Gordon (S. S. J. J. Coney), Bud Mersereau, Claude Lewis, Ed Ryan, Walter Richards, Jr., Dan Dobler, Andy Wilson

GENERAL COMMITTEE

W. H. Wickersham
Honorary General Chairman

John Eidom
General Chairman

Capt. F. D. Arthur
Asst. General Chairman

John C. McHose
Master of Ceremonies

Capt. T. W. Peters
Chairman—Attendance

H. Neergaard
Chairman—Barbecue

Jim Buntin
Chairman—Baseball

Bud Richley
Chairman—Entertainment

Frank Cavanaugh
Chairman—Grounds

Charlie Houghton
Chairman—Handicap

Harold Bowen
Chairman—Prizes

J. M. Costello
Chairman—Program

Lloyd J. Moore
Chairman—Reception

James Craig
Chairman—Rules

Remington Mills
Chairman—Tennis

J. W. Malseed
Chairman—Tournament

John E. Marshall
Chairman—Tug-O-War

E. J. McKee
Finance

L. H. Connor
Secretarial

So the score board tells the story and to every one of the many who worked diligently to make this 1941 Bilge Barbecue a record breaking success PACIFIC MARINE REVIEW expresses appreciation for the opportunity to be aboard! How long, Bilge Club, 'til the next one?

Left: Bud Richley, Joe Taylor, Chief Wall, Pan Pacific Downey, Maurice Keily

Right: Mr. Becker (catcher), Jack Logan (batter)

Running LIGHTS

Who When Where

Time out for our cameraman during the final check-up on the Mormacsun before she was delivered to her owners, Moore-McCormack Lines, Inc.

Left to right, standing: A. J. Christie, Assistant Machinery Inspector, U. S. Maritime Commission; J. H. Hoffman of Foster Wheeler Corp., San Francisco; K. Duncan, guarantee engineer of Moore Dry Dock Co.; M. A. Locaty, chief engineer, Mormacsun; H. R. Glennon, efficiency engineer, Moore-McCormack. Front: John V. Borkowski, guarantee engineer, Foster Wheeler Corp., New York; Louis Spiwak, engine room electrical installation; Willis Fleming, installation engineer, Todd Combustion Equipment Co.

What Your Friends Are Doing

The election of Philip B. Iglehart to the office of vice president in charge of operations of Grace Line was announced on June 9th by R. Ranney Adams, executive vice president of the line.

In his new post Mr. Iglehart succeeds Mr. Adams who became executive vice president and a member of the board of directors, May 27.

Mr. Iglehart, son of **D. Stewart Iglehart,** president of W. R. Grace & Co. and Grace Line, joined Grace Line in 1931 after attending Yale University and St. Paul's.

Mr. Iglehart began his career with Grace Line by serving as a cadet on the ships, and during the past ten years has served in many departments of the company. He was made secretary and assistant vice president in 1939. He has also acted for the company in South America and Europe on numerous occasions. For several years Mr. Iglehart worked on Grace Line piers in Brooklyn and on the North River, where he handled pier and ship operations.

* * *

After many years with the Seattle Port Commission, Horace P. Chapman was elected in June to the post of president of the board, replacing Smith M. Wilson, who assumes the post of vice president. Secretary J. A. Earley was reelected and Colonel W. C. Bickford continues as port manager and chief engineer.

* * *

As a guest speaker at the regular San Francisco Junior Foreign Trade Association meeting on June 18, M. J. Buckley, vice president in charge of traffic of the American President Lines, spoke on "U. S. Maritime Situation Today."

* * *

R. R. Adams, executive vice president of Grace Line, and Eugene F. Moran, of the Moran Towing and Transportation Co., were elected in June as directors of the Maritime Commission of the Port of New York.

* * *

Stanley J. Smith, practicing law in Oakland, California, since 1906, was appointed a member of the Oakland Port Commission by Mayor William J. McCracken in June. He replaces Dr. George C. Pardee, who resigned because of ill health.

MARINERS CLUB of CALIFORNIA

A. T. HUNTER, *President*
ERIK KRAG, *Vice-President*
STANLEY E. ALLEN, *Secretary-Treasurer*

Board of Governors

OSCAR J. BEYFUSS
WINSLOW D. CONN
ARTHUR DONNELLY
FRANK H. FOX
R. H. GLISSMAN
C. M. LE COUNT
EDWARD MACFARLAN
FRED MC LEAN
DAVID MILLAR
THOMAS G. MUNRO
F. P. RITCHIE
THOMAS A. SHORT

Ever hear the flow pack clear and the
blast of the old bull whale,
And the deep seal roar that beats off
shore above the loudest gale.
Ever they wait the winter's hate as the
thundering boorga calls,
Where northward look they to St.
George and westward to St. Pauls.

Rhyme of "The Three Sealers"

With this alluring rhyme, Capt. A. T. Hunter, president of The Mariners, piped nearly one hundred members aboard for the early July luncheon-meeting at the St. Julian on Wednesday, the second.

Dynamic speaker of the day was N. J. L. Pieper, special agent in charge of the F. B. I., U. S. Department of Justice.

His audience was positively "on the edge of their chairs" during the revelating account of Sabotage Prevention as experienced by speaker Pieper's aides.

"Revelating," indeed . . . as few of us realized the ramifications of the forces engaged in the destructive practice—as well as the far-reaching activities of the Bureau to cope with these subversive, undermining activities, particularly in the fields so close to our own safe-being.

Once again The Mariners enjoyed the camaraderie which so distinguishes their get-togethers. As remarked above, the turn-out almost reached the century mark!

At the July 2 luncheon program, the announcement was repeated to remind all hands that The Mariners' Club will go right on functioning during the summer months.

Some mighty interesting events are being planned, with the boys in charge considering an outing.

We're for that strong!

DO YOU REMEMBER?

Old-time members of The Mariners' Club will have no difficulty in naming these Thespians. This one will take you back to those good old days of San Francisco's original Propeller Club. The event pictured occurred at the Commercial Club around Christmas time—how many years ago?

W. T. Hunter who has been general freight agent covering the European services since opening of Interocean Steamship Corporation offices in San Francisco on July 1, 1930, will retire on pension as of July 1 this year.

Bill Hunter started his career in the railroad business with Erie Railway in 1897. He later was in the employ of C. & N. W. Railway for 20 years and was freight agent for the Intercoastal service of the Luckenbach Line and later the Panama Pacific Line.

* * *

A series of lectures on international foreign trade law will be given by Professor Phillip W. Thayer of the Harvard Law School in San Francisco during the last week in August as announced by W. L. Montgomery, manager of the Foreign Trade Association of the San Francisco Chamber of Commerce, sponsors of the series.

Similar series were presented in San Francisco during the summers of 1939 and 1940.

Mr. Thayer will discuss contracts of sale, letters of credit and foreign exchange and insurance problems.

News of the Propeller Clubs of the United States

The Port of San Francisco

Charles L. Wheeler
President
John E. Cushing
First Vice-President
Arthur B. Poole
Second Vice-President
Hugh Gallagher
Third Vice-President
Eugene F. Hoffman
Secretary-Treasurer

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Port of San Francisco

Doubtless no pun was intended when our program boys announced the Final Spring Roundup—with a talk on Mare Island. Albeit, 'twas a good lively rodeo with Chef Bohn of the Palace carving an electrically (batteries-concealed) resplendent birthday cake and President Charles L. Wheeler putting the entries through their paces in fast-track tempo.

And although the Port of San Francisco monthly luncheon-programs will vacation until September there is plenty of pre-convention work to keep the boys in contact.

But, getting back to the June 11th meeting: it was the privilege and pleasure of President Wheeler to introduce his good friend Commander R. B. England, personnel superintendent of California's United States Navy Yard.

"Mare Island builds, as well as repairs ships!" the Commander reminded us. "The record goes back to the construction of our first ship in 1869, a 250-ton frigate which makes a striking contrast with the latest product—the 32,500-ton California."

Talking informally, the speaker emphasized the care and eternal vigilance which must go into the construction of naval vessels.

"Take the submarine as an example. Integrity is vitally essential when you are down 250 feet surrounded by a 6-ton pressure. There is no bailing out of a sub!

"Strength must be built into all naval vessels. It has got to be there—to withstand the impact of attacking shells as well as from the detonation of firing.

"Consider the multitudinous devices, instruments, gauges, and auxiliaries aboard——"

Tracing the progress of building one of the big battle-wagons Commander England told of the elaborate testing through the use of models which precedes the keel-laying. Then plans are drawn and devious study is devoted to the three prime essentials—Speed—Armament—Size.

Width of a naval vessel must be watched as the limit is determined by the Panama Canal breadth.

Distribution of weight, speed of ship, speed of construction, all must be determined accurately—precisely.

It usually takes five years to build one of the big fellows like the California. "Contrast this with the construction of a merchant ship, usually only 12 to 18 months in the building. Remember," said Commander England, "it is essential that Naval construction shall be in progress *before the ships are actually needed!*

"We are proud of our slogan 'Built at Mare Island!' This insignia aboard a ship means something—throughout the fleet."

The speaker pointed out that navy practice in construction provides for "some riveting along with the welding. It is impractical to weld a ship which is over 200 feet in length. Welding is usually done on thwart-ship members while the riveting is ordinarily confined to longitudinal members."

The personnel director explained the exhaustive investigations which precede the selection of welders—because of the grave responsibility of their work.

There are some 19,000 employees at Mare Island. The shops are now working 24 hours a day . . . some of them seven days a week!

In conclusion the Commander made the declaration that Mare Island still has the Nation's speed record—referring to the building of the U. S. S. Ward. She was launched in 17 working days!

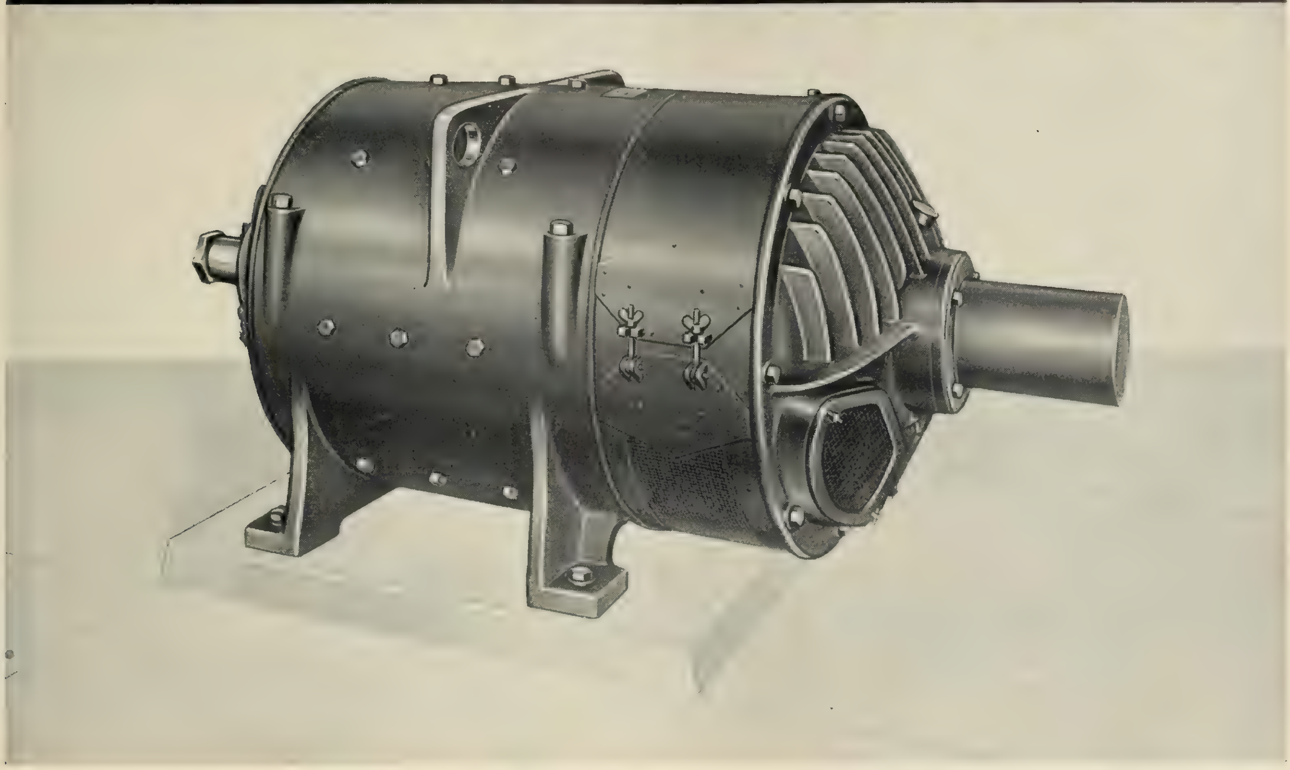
Port of Los Angeles

Annual election of the Propeller Club, Port of Los Angeles No. 66, held Friday, June 27, at the Los Angeles Stock Exchange Club, resulted in the election of Fred A. Hooper to the presidency, succeeding Ralph J. Chandler, resident manager of the Matson Line. Mr. Hooper is district manager of the American-Hawaiian Steamship Company.

High praise was given retiring president Chandler on the success of the local Propeller Club. Taking office when the club was chartered two years ago he carried on through the difficult organization period, was returned to office for a second term and will continue on the board of governors for one more year. On behalf of the membership House Committee chairman James Adams presented Mr. Chandler with a bronze desk set.

DIEHL

TRAWL WINCH MOTORS



for *HEAVY DUTY* MARINE SERVICE

Trawlers are heavy-duty work boats. Their operating equipment must withstand severe overloads and the toughest punishment of the elements. Diehl Trawl Winch Motors are specifically intended for this kind of service. That they satisfactorily fulfill requirements has been demonstrated for years on numerous prize-catch vessels of the fishing fleets.

The motors are of unusually heavy construction, particularly as to their shaft and bearing structure, and are specially insulated for maximum protection against the action of sea air and moisture. They provide a superabundance of power to meet the most severe service demands without damage.

The possible conversion of Diehl-equipped fishing trawlers into minesweepers will not affect the utility and efficient performance of Diehl Trawl Winch Motors. Experience has shown that they are admirably adapted to this type of work.

The specification of Diehl Motors by prominent fishing boat owners and operators testifies to their fitness for present day marine requirements.

DIEHL MANUFACTURING COMPANY, Elizabethport, N. J.
Electrical Division of THE SINGER MANUFACTURING CO.

THOMAS A. SHORT CO. - 575 HOWARD STREET - SAN FRANCISCO, CALIFORNIA

Edgar M. Wilson, general agent for the American President Lines, was elected first vice-president and Harry J. Summer, principal surveyor for the American Bureau of Shipping, was elected second vice-president. James Adams, admiralty attorney and member of the firm of Lillick, Geary, McHose & Adams, was elected third vice-president.

Succeeding David Livingstone as secretary-treasurer was Norman E. Dunnavant, publisher of the *Daily Shipping Guide and Commercial News.*

The following were elected to the Board of Governors for a three year term: Mr. Adams; Charles H. Bayly, secretary-treasurer of the Crescent Wharf & Warehouse Company; J. B. Hurd, general agent, passenger department, Matson Line; Captain I. C. Johnson, U.S.N. Ret., director, 11th Naval Reserve District; L. K. Vermille, admiralty attorney; and Howard H. Wickersham, manager of the firm of W. H. Wickersham & Company. Elected to fill a vacancy on the board for one year was Robert W. Gearhart, contracting manager for the Consolidated Shipbuilding Corporation.

Port of Tacoma

The final "get-together" of the season of the Propeller Club, Port of Tacoma, was held Tuesday evening, June 17, with a picnic at Reeploeg's Angle Lake Plunge at Angle Lake, located on the Tacoma-Seattle Highway.

The picnic was to be held under the trees at the side of the lake but, due to the fact that it was raining, the affair was held indoors in the dance pavilion.

Members and friends were requested to be at the lake at 7 p. m. and by that time most of the members were on hand, along with a great many guests from the Propeller Club of Seattle.

A sumptuous dinner of baked Puget Sound salmon, with all the waterfront trimmings—beer—and genuine deep-sea music by El Nomellini and his accordian, was enjoyed.

The first joint-picnic sponsored by the Propeller Clubs of Seattle and Tacoma was an enjoyable one, even though the weather was bad, and will be repeated next year.

CHARLES C. CRAMP
Secretary.

The Big Convention In the Making

Backed by the intense interest of San Francisco's ship-operating, shipbuilding, marine insurance and closely-allied maritime industries, the 1941 convention of the Propeller Clubs of the United States, featuring the American Merchant Marine Conference in the city by the Golden Gate, seems destined to be a tremendous success.

General Chairman Edward H. Harms rallied his committee chairmen together on the evening of July 2 for progress reports, and out of this meeting came the assurance of big attendance, exceptionally worth-while programs and convention features which only San Francisco can offer its visitors.

Those well-ordered four days of October will be crammed to all sensible limits with things to do, places to visit, trips to make! We like best the crowning event, which is being planned for one thousand or more guests at the Claremont Country Club. We hear whispers—which later will be shouts—of a barbecue, surrounded by true out-West atmosphere and entertainment.

The parade of events for all who are fortunate enough to make the Indian Summer pilgrimages to Northern California with the convention as their Mecca, reads like the fabulous trip aboard a magic carpet. The convention committees have a glorious advantage, considering the countless attractions which the "locale" offers.

The visiting ladies will be regally entertained, with Mrs. Charles L. Wheeler, wife of Port of San Francisco's prexy, as committee leader.

Greatly encouraged by the support and enthusiasm of the city's leading maritimers, the builders of the 1941 Big Show are resultfully throwing their talents, time and energy into the planning.

So—it's on to San Francisco—and plan now to attend!

J. LEWIS LUCKENBACH, *Chairman of the American Merchant Marine Conference Committee, will lead Eastern caravan to San Francisco, convention city for 1941.*

Again this year the Conference will be sponsored by the Propeller Club of the United States.

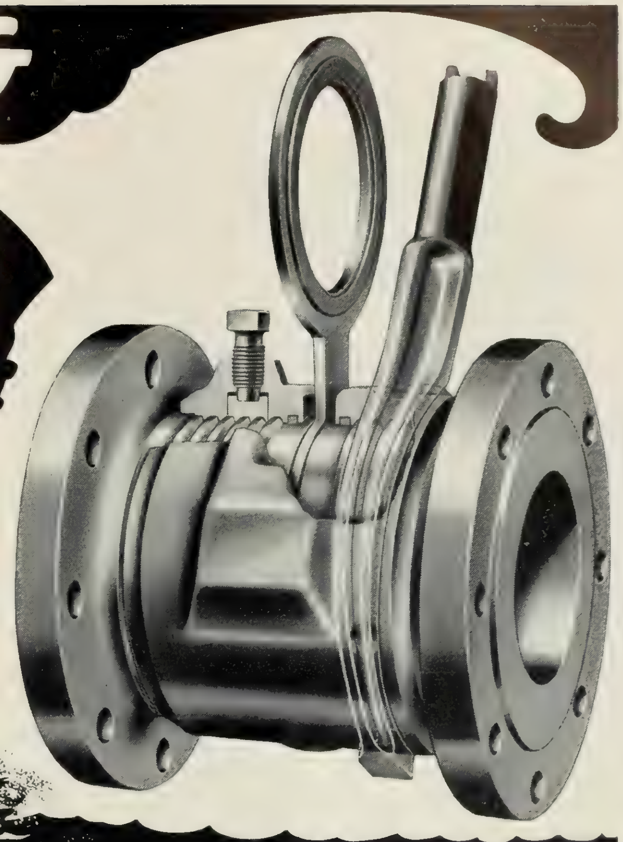
Conference sessions will start on Tuesday, October 23rd at the Fairmont Hotel on famed Nob Hill, in the historic city of the "Gold Coast."

For BLINDING TANKER LINES

There are three reasons why we believe that you will like S. & J. Standard Line Blinds:

1. They are absolutely tight. They perform their function perfectly without any mixing of liquids.
2. They are fast in operation. Less than a minute is required to change the spectacle and open or blind a line.
3. They are lighter in weight and less expensive than any comparable equipment used for the same purpose.

Made in a full range of sizes from 2" to 10". Write for complete details and prices.



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THE 4 "RIO" SISTERS

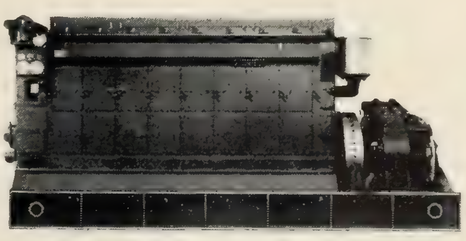
DESIGNERS:
U. S. Maritime Commission, Washington, D. C.

BUILDERS:
Sun Shipbuilding & Drydock Co., Chester, Pa.

OWNERS AND OPERATORS:
Moore & McCormack Lines, Inc., New York, N. Y.

MAIN GENERATOR SETS:
5 SUPERIOR Model MS eight-cylinder, four-cycle, 12½" x 15" Diesels, 600 H. P. at 425 r.p.m. direct connected to 400 kw. 240 volt direct current generators.

EMERGENCY GENERATOR SET:
One SUPERIOR Model GD-6 six-cylinder, four-cycle 5½" x 7" Diesel, 112 H.P. at 1200 r.p.m. direct connected to 75 kw. generator.



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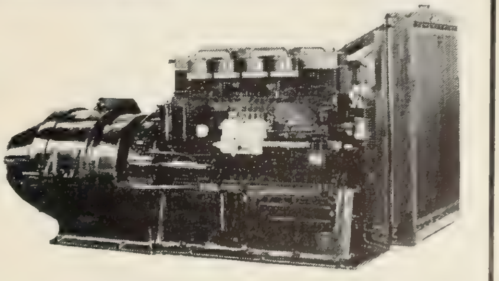

EMERGENCY GENERATOR SET

THE NATIONAL SUPPLY COMPANY . . . SUPERIOR ENGINE DIVISION

SALES OFFICES: Springfield, Ohio; Philadelphia, Penna.; New York, N. Y.; Los Angeles, Cal.; Jacksonville, Fla.; Houston, Texas; St. Louis, Mo.; Fort Worth, Texas; Tulsa, Okla.; Boston, Mass. FACTORIES: Springfield, Ohio; Philadelphia, Penna.

PROGRESS IN *American Shipyards*

Pacific Coast

ANDERSON & CHRISTOFANI
San Francisco, Calif.

New Construction:

Six 57′ AMC coastal mine sweepers for U. S. Navy.

One 48′ yacht for Hermon Hogrefe.

One 60′ purse seiner for S. Piazza.

ASSOCIATED SHIPBUILDERS
Seattle, Wash.

New Construction:

One insulated self-propelled lighter for delivery to U. S. Navy at Puget Sound Navy Yard.

Four small seaplane tenders for delivery to Puget Sound Navy Yard.

ASTORIA MARINE CONSTRUCTION CO.
Astoria, Ore.

New Construction:

Hull No. 1100, wood hull troller. 41′ x 11′ x 4′6″; Chrysler Crown engine. **Estimated delivery date June 30. 1941.**

Hull No. 1090, wood hull trawler for stock. 56′ x 15′6″ x 7′6″; 135-hp Superior diesel engine.

Hull No. 1111, wood hull trawler. 60′ x 12′ x 6′; 100-hp Caterpillar diesel engine. **Delivery date June 6, 1941.**

Four 135′ wooden diesel-powered mine sweepers for U. S. Navy. Delivery in 14 months.

BASALT ROCK CO., INC.
Shipbuilding Yard
Napa, Calif.

New Construction:

Twelve steel seagoing 1000-ton cargo barges; contractors, Pacific Navy Air Bases. Delivery at San Francisco Bay. 150′ x 40′ x 12′. Contract awarded November 15, 1940. **Delivery dates, first two about April 15; thereafter one every 7 or 10 days.**

Two 10,000-bbl. fuel oil tankers for delivery to Mare Island Navy Yard. 235′ x 37′ x 19′; cost $1,800,000. Contract awarded by Navy Dept., Bureau of S. & A., Washington, D. C. **Keel laying date, June 20, 1941.**

BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Division
San Francisco Yard
San Francisco, Calif.

New Construction:

Hulls Nos. 5362-5364, three C-1 cargo vessels for U. S. Maritime Commission. 395′ x 60′ x 37′6″; 6400 gross tons each; 4000-hp. Full scantling steam propulsion type. Keel laid, No. 5364, January 15, 1941. **Launching** dates, No. 5362, January 10, 1941; No. 5363, March 12, 1941; **No. 5364, July 3, 1941.**

Hulls Nos. 5368-5383, sixteen 2100-ton destroyers, DD526-DD541.

Hulls Nos. 5366-5367, two 1650-ton destroyers, DD459-DD460, for U. S. Navy. Keels laid January 13, 1941.

Hulls Nos. 5390-5396, seven 1620-ton destroyers, DD605 - DD611. Keel laying dates, Nos. 5390, 5391, March 25 and 28, 1941.

Hulls Nos. 5386-5389, four 6000-ton cruisers, CL95-CL98.

BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Division
San Pedro, Calif.

New Construction:

Hulls Nos. 9001-9004, four 2100-ton destroyers, DD544-DD547.

Hulls Nos. 9007-9012, six 1620-ton destroyers, DD612-DD617. Keel laying dates, Nos. 9007, 9008, May 1, 1941; Nos. 9009, 9010, May 29, 1941.

COLBERG BOAT WORKS AND STEPHENS BROS.
Stockton, Calif.

New Construction:

Three large wooden mine sweepers for U. S. Navy.

COMMERCIAL IRON WORKS
Portland, Ore.

New Construction:

Four anti-submarine net tenders.

Seven steel mine sweepers for U. S. Navy.

CONSOLIDATED STEEL CORP., LTD.
Los Angeles, Calif.

New Construction:

Hulls Nos. 156-159, four C-1-BT, full scantling, turbine propulsion cargo vessels for U. S. Maritime Commission. Keel laying date, No. 159, April 1, 1941. **Launching dates,** No. 157, March 27, 1941; **No. 158, June 26, 1941;** No. 159, September 10, 1941. **Delivery dates, No. 156, July 30, 1941;** No. 157, August 29, 1941; No. 158, October 23, 1941; No. 159, December 23, 1941.

Hulls Nos. 181-182, two Design P1-S2-L2 twin screw turbine propulsion transports for U. S. Maritime Commission. Launching dates January 5 and June 8, 1942. Delivery dates September 26 and November 5, 1942.

Hulls Nos. 162-193; 206-221, 48 steel lighters. Keel laying dates, No. 206, August 1, 1941; No. 207, September 22, 1941. Launching dates, No. 206, February 9, 1942; No. 207, May 5, 1942. Delivery dates, No. 206, Nov. 8, 1942; No. 207, November 5, 1942.

Four C-1 cargo vessels.

FELLOWS & STEWART, INC.
Wilmington, California

New Construction:

One 100′ V-bottomed kelp harvester.

Two 45′ taxi boats.

F. L. FULTON
Antioch, Calif.

New Construction:

Six 97′ wooden mine sweepers for U. S. Navy.

GENERAL ENGINEERING & DRY DOCK CO.
Alameda, Calif.

New Construction:

Four anti-submarine net tenders for U. S. Navy.

Eight mine sweepers for U. S. Navy.

HARBOR BOAT BUILDING CO.
Terminal Island, Calif.

New Construction:

Fifteen 60-foot U. S. Navy boats. Delivery date, first two, June 11, 1941.

Hulls Nos. 117-120, four 136′ motor mine sweepers for U. S. Navy. Keels laid, No. 117, May 8, 1941; No. 118, May 12, 1941.

LAKE WASHINGTON SHIPYARDS
Houghton, Wash.

New Construction:

Four anti-submarine net tenders.

Four thousand A. S. N. T. floats.

Coast and Geodetic Survey ship.

Six seaplane tenders for U. S. Navy.

LOS ANGELES SHIPBUILDING & DRY DOCK CORP.
Los Angeles, Calif.

New Construction:

Hulls Nos. AR6-AR8, three repair vessels for U. S. Navy.

Eliminating a Wet Floor Slipping Hazard

. . . Alundum Tile

A STRIP of Alundum Tile replaced the original tile down the entire length of this row of ranges. Now the busy chefs have a safe, sure footing even when liquids are spilled—and the non-slip surface of the Alundum Tile will never wear slippery.

Catalog A gives full information about Alundum Tile. Write for a copy—also for Catalog B which describes Alundum Ceramic Mosaic Tile, another Norton Floors product.

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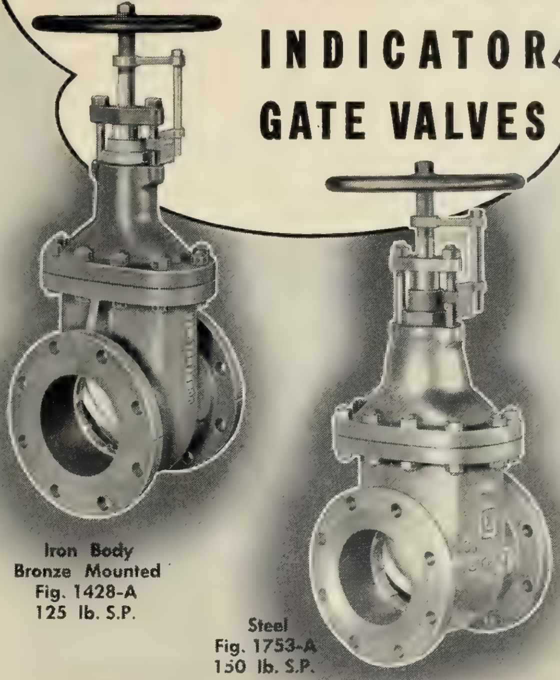
NORTON FLOORS
ALUNDUM TILES—TREADS—AGGREGATES

Don't Guess BE SURE *with* LUNKENHEIMER INDICATOR GATE VALVES



Iron Body
Bronze Mounted
Fig. 1428-A
125 lb. S.P.

Steel
Fig. 1753-A
150 lb. S.P.

With perfectly guided tight-seating disc plus the indicator to clearly show open or closed position—Lunkenheimer Indicator Gate Valves provide a double safety factor for ships at sea.

They are part of the complete line of Lunkenheimer Marine Valves and Accessories regularly made and tested in accordance with the requirements of the Bureau of Marine Inspection and Navigation, the American Bureau of Shipping and Lloyd's Bureau of Shipping.

Lunkenheimer distributors are located in shipping centers everywhere. Call on them for your requirements and ask for your copy of Bulletin M-1 "Lunkenheimer Valves for Marine Service".

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"QUALITY"
CINCINNATI, OHIO. U. S. A.
NEW YORK CHICAGO
BOSTON PHILADELPHIA
EXPORT DEPT. 318-322 HUDSON ST. NEW YORK

MOORE DRY DOCK CO.

Oakland, Calif.

New Construction:

Hull No. 198, Mormacsun; one C-3 vessel for U. S. Maritime Commission. LOA 492′0″, LBP 465′; breadth molded 69′6″; depth molded 42′6″. **Delivery date June 6, 1941.**

Hull No. 200, caisson gate for Bureau of Yards and Docks; for D. D. No. 5, Puget Sound, Wash. 150′ x 22′ x 57′; 1800 tons weight. Launching date March 18, 1941. **Delivery date July 1, 1941.**

Hulls Nos. 201-203, three cargo and passenger vessels for U. S. Maritime Commission and Alcoa Steamship Co. 442′x62′x25′; depth molded to bridge deck 41′6″; 8500 hp; 17 knots speed; passenger carrying capacity 38. **Keel laying dates,** March 26, **June 3** and September 10, 1941. Estimated delivery dates January 1, March 15 and June 1, 1942.

Hulls Nos. 204-206, three defense vessels for U. S. Navy and Dravo Corp. 110′ x 34′ x 11′3″ molded depth; two diesel-driven generators. **Delivery dates, No. 204, June 4; No. 205, June 18; No. 206, July 1, 1941.**

Two submarine tenders for U. S. Navy.

Five submarine rescue vessels for U. S. Navy.

Six C-2 cargo vessels.

Twelve C-2 cargo vessels.

Conversion:

Hull No. 195, U. S. S. Tangier, to seaplane tender for U. S. Navy.

PACIFIC BRIDGE CO.

San Francisco, Calif.

New Construction:

One seagoing drydock for U. S. Navy. Cost $1,649,000.

PACIFIC DRY DOCK & REPAIR CO.

Oakland, Calif.

New Construction:

One all-welded steel oil barge. 148′ x 38′ x 9′; 300,000 gal. capacity.

Lighters. Cost $284,572.

SEATTLE SHIPBUILDING AND DRY DOCK CO.

Seattle, Wash.

New Construction:

Four 136′ mine sweepers for U. S. Navy.

SAN DIEGO MARINE CONSTRUCTION CO.

San Diego, Calif.

New Construction:

Four large wooden mine sweepers for U. S. Navy.

One 65′ wooden tuna boat. Estimated launching date, July 1, 1941.

SEATTLE-TACOMA SHIPBUILDING CORP.

Tacoma, Wash.

PLANT No. 1

New Construction:

Hulls Nos. 3, Cape Cleare; No. 4, Cape Fairweather; No. 5, Cape Douglas; five C-1 cargo vessels for U. S. Maritime Commission. Single screw, full scantling diesel propulsion type. Two General M. A. N. 2100-hp engines; 14 knots speed. **Launching dates,** No. 4, April 11, 1941; **No. 5, June 10, 1941. Delivery dates,** No. 3, August 8, 1941; **No. 4, July 7, 1941;** No. 5, September, 1941.

Hulls Nos. 6-7, two C-3 shelter deck type cargo steamers for U. S. Maritime Commission. To be converted on completion to U. S. Army troopships. **Keel laying dates,** April 21 and **June 16, 1941.** Launching dates, August 15 and October 1, 1941.

Hulls Nos. 8-11, four C-3 cargo ships for U. S. Maritime Commission. 465′ x 69′6″ x 42′6″ (molded); 8900 tons; 8500-hp steam turbine propulsion; cost $2,990,000. **Keel laying dates, June 18,** October 8, December 29, 1941, and January 22, 1942. Launching dates, October 18, 1942, and January 15, March 29, April 22, 1942.

Thirty C-3 cargo vessels.

SEATTLE PLANT

New Construction:

Twenty-five destroyers for U. S. Navy.

THE SHAIN MANUFACTURING CO.

Seattle, Washington

New Construction:

One 65′ ferryboat for U. S. Navy.

One model 30 trimmer ship Air Flo sedan for Chas. Cole, Seattle; Chrysler Crown.

One model 36 trimmer ship Air Flo sedan for Paul Isaacson, Seattle; Chrysler Crown.

One model 50 trimmer ship ferry for Horluck Trans. Co., 110-hp Buda diesel.

One model 49 trimmer ship, express cruiser, for stock.

STEPHENS BROS.

Stockton, Calif.

New Construction:

Hull No. 648, cabin cruiser, for stock, 40′ x 11′9″ x 4′6″, 110-hp twin gas engine, total cost $12,500.

Hull No. 661, raised deck cruiser for V. A. Rodden, 39′4″ x 10′9″ x 2′6″, 140-hp twin Chrysler Royals.

Three 136′ wooden mine sweepers.

TODD-CALIFORNIA SHIPBUILDING CORP.

Richmond, Calif.

New Construction:

Thirty cargo vessels for British Purchasing Commission. 10,000 dwt; 416′ long, 57′ beam. Cost $50,000,000.

TODD-SEATTLE DRY DOCKS

Seattle, Wash.

Conversion work.

WESTERN BOAT BUILDING CO., INC.

Tacoma, Wash.

New Construction:

Hull No. 145, Anna M., live bait tuna boat. Launching date, April 5, 1941.

Hull No. 146, fishing boat, 95′ x 24′ x 11′. Keel laid April 15, 1941.

Conversion:

Fishing boats Majestic and Mahree Star, Ketchikan, Rio Del Mar, Valiant and Challenger conversion to naval use.

WESTERN PIPE AND STEEL CO.

South San Francisco, Calif.

New Construction:

Hulls Nos. 60-61, two C-1 cargo vessels for U. S. Maritime Commission. Full scantling diesel propulsion type; single screw; two Busch-Sulzer 2100-hp engines. Delivery dates, **July 15** and September 13, 1941.

Hulls Nos. 62-65, four C-3 cargo ships for U. S. Maritime Commission. 492′ x 69′ x 42′6″; 8900 tons; 8500-hp; steam propulsion; $2,990,000 each. Keel laying dates, February 28, May 5, August 1 and September 30, 1941. **Launching dates, July 15,** September 15, December 5, 1941, and January 15, 1942. Delivery dates, February 24, May 5, May 15 and June 24, 1942. All above dates estimated.

Navy life floats.

Seventeen C-3 cargo vessels.

WILLAMETTE IRON & STEEL CORP.

Portland, Ore.

New Construction:

Two minelayers, CM6, U. S. S. Catskill, and CM7, U. S. S. Ozark, for U. S. Navy.

Atlantic, Lakes, Rivers

ALABAMA DRY DOCK & SHIPBUILDING CO.

Mobile, Ala.

New Construction:

Hulls Nos. 226-227, two steel barges, 105′ x 32′ x 7′. Launched March 25, 1941.

Two 6500-ton tank ships for National Bulk Carriers, Inc., 416′ x 56′ x 35′, 2400-hp diesel. Launching dates, October 18, 1940; April 30, 1941.

Hulls Nos. 231-243, all-welded Emergency cargo vessels for U. S. Maritime Commission. Cost $19,500,000.

LESTER F. ALEXANDER CO.

New Orleans, La.

New Construction:

Two tugs, North Star and Peggy Wilson, 68′ x 17′ x 8′, 275 hp.

One all welded steel barge, 100′ x 28′ x 7′.

One all-welded steel barge, 92′ x 26′ x 6′.

One all-welded steel barge, 110′x30′x7′6″.

AMERICAN BRIDGE COMPANY

Pittsburgh, Pa.

New Construction:

Ten freight barges for Inland Waterways Corp., St. Louis, Mo. 280′ x 48′ x 11′.

Eight dump scows. 160′ x 50′6″ x 13′6″; for Panama Canal.

Two fueling scows for Carnegie Illinois Steel Co. 125′ x 26′ x 11′.

AMERICAN CAR & FOUNDRY CO.

Wilmington, Delaware

New Construction:

Thirty-eight 45′ lighters, equipped with tanks for carrying liquids, for U. S. Navy. Total cost $1,020,262.

Export Lines Personnel

On July 5, John F. Gehan, vice president of American Export Lines, announced the appointment of deck and engineering officers who will serve aboard the fast freighter, Exceller, under **Captain H. L. Switzer.**

The deck staff will comprise J. La Belle, first officer; V. E. Dougherty, second officer; A. L. Miller, third officer, and W. F. Sheehan, assistant third officer.

Serving with David R. Smouse, chief engineer, will be: W. H. Riley, first assistant; W. E. Ells, second assistant; A. L. Hicks, third assistant, and T. J. Berry, junior third assistant.

Officers La Belle, Dougherty, Miller, Smouse, and Riley served aboard the Exporter, prototype of eight company-designed vessels recently built at Quincy, Mass., which has been requisitioned by the Maritime Commission for National Defense service.

The Exceller, a company-designed, fast freighter of the "modified Exporter" type, was launched at Bath Iron Works, Bath, Maine, on May 10, and will have its sea trials within the next few weeks. It is due to be turned over to its owners about July 25, and will be placed in the company's New York-India-Burma service.

Good Neighbor News

Passenger traffic on Moore-McCormack Lines, operators of the Good Neighbor Fleet to Brazil, Uruguay and Argentina, has shown a 14 per cent increase during the first six months of 1941 in comparison with the same period of last year, and the same increase is expected for the summer months, it was announced July 6 by **Commander Robert C. Lee,** executive vice president of the company.

During the first half of 1940 the Lines carried 9,413 passengers. Up to and including the sailing of the liner Brazil southbound June 20, it has had 10,758 this year, or an increase of 1,345. About 55 per cent of the business has been southbound and 45 per cent north.

Argentina has a brilliant winter season, with operas at the famous Teatro Colon in Buenos Aires, polo games every week, horse racing at fine tracks and many social activities. The season will be climaxed by the great Rural Show, or livestock exhibition, to be held in Buenos Aires during August.

Mr. Lee also pointed out that group travel to South America has been unusually heavy this year. The Yale Glee Club of sixty-five members and a number of models from Saks Fifth Avenue, for instance, sailed June 20 on the Brazil. The American Ballet sailed recently and a group organized by the Carnegie Foundation for International Peace has just returned. In addition, many South American educators and economic and governmental missions have used the Good Neighbor Fleet in recent months.

Passenger traffic to South America has shown consistent increases ever since Moore-McCormack Lines began operation of the Good Neighbor Fleet in October, 1938, according to Commander Lee. The only two passenger lines engaged in service to the east coast of South America during 1937 carried a total of 8,968 passengers, or 1,790 fewer than those carried by the Good Neighbor Fleet in the first six months of this year. In 1939, the first full year of operation of the 33,000-ton luxury liners Argentina, Uruguay and Brazil the company carried 17,020 passengers and in 1940 it had a total of 20,693.

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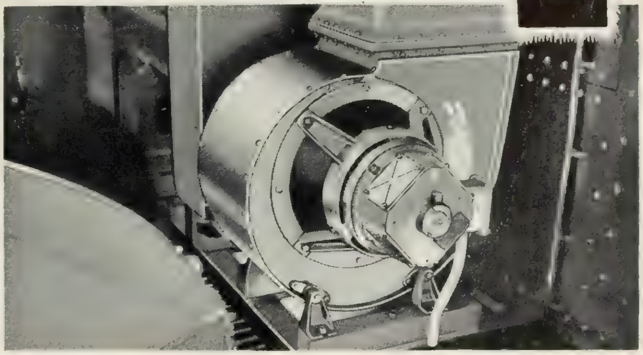

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ORDERS JUST RECEIVED

● 2—18100 ton Tanker Hulls 219-220 for Panama Transport Co. *Sun Shipbuilding & Dry Dock Co., Chester, Pa.*

● 4—Tankers for Sinclair Refining Co., Hulls 190-193. *Federal Shipbuilding & Dry Dock Co., Kearney, N. J.*

● 2—C-1A Cargo Vessel Hulls 1075-1076 Maritime Commission. *Pusey & Jones Co., Wilmington, Dela.*

● 2—Union Oil Tanker Hulls 4360-61. *Bethlehem Steel Co.*

● 1—7000 ton grain carrier Cargill McAlbany, N. Y.

ILG ELECTRIC VENTILATING CO.
2824 N. CRAWFORD AVENUE, CHICAGO, ILL.
Offices in 43 Principal Cities

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Vitalized* VENTILATION
AND AIR CONDITIONING
*AIR CHANGE... NOT JUST AIR MOVEMENT!

Eight 45′ welded steel twin screw lighters, for War Dept., Quartermaster Corps, diesel propelled. Total cost $173,126.

Four 135′ mine sweepers for Navy Dept., Bureau of Supplies and Accounts. Total cost $1,340,000.

THE AMERICAN SHIP BUILDING CO.
Cleveland, Ohio

New Construction:

Twelve net tenders for U. S. Navy; (6 at Lorain, Ohio; 6 at Cleveland, Ohio). 151′8″ x 30′6″ x 16′6″; diesel-electric propulsion; contract price $6,357,000.

Four diesel trawlers for General Seafoods Corp. 146′8″ L. O. A. x 26′0″ x 14′4″. (2 at Lorain, Ohio; 2 at Cleveland, Ohio.) Delivery date, November 15, 1941.

Eight mine sweepers (4 at Lorain, Ohio; 4 at Cleveland, Ohio) for U. S. Navy; 220′ O.A. x 32′ x 17′; diesel-electric propulsion; contract price, $13,736,000.

Two bulk freighters (at Lorain, Ohio) for Pittsburgh Steamship Company; 640′ O.A. x 67′ x 35′; geared-turbine propulsion. Delivery date, October 1, 1942.

Fifteen 2500-ihp, three cylinder triple expansion engines for Maritime Commission design EC2-S-C1 cargo vessels.

BATH IRON WORKS
Bath, Maine

New Construction:

Hulls Nos. 184-187, four cargo ships for American Export Lines. 400′ x 60′ x 39′. Delivery dates September and October, 1941, and April and June, 1942.

Hulls Nos. 188-189. DD457 and DD458, two destroyers for U. S. Navy. Delivery dates December, 1941, and February, 1942.

Hulls Nos. 190-195, DD449-451, 467-469, six destroyers for U. S. Navy.

Hulls Nos. 196-206, DD507-DD517, eleven destroyers for U. S. Navy.

Hulls Nos. 208-213; DD629-DD631; DD 642-DD644; six destroyers for U. S. Navy.

BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Division

Fore River Yard

Quincy, Mass.

New Construction:

Hull No. 1478, Massachusetts, 35,000-ton battleship for U. S. Navy. Keel laid July 20, 1939.

Hulls Nos. 1479, San Diego; and 1480, San Juan; two 6000-ton cruisers for U. S. Navy. Keels laid March 27 and May 15, 1940.

Hull No. 1484, cargo vessel for U. S. Maritime Commission. 450′ x 66′ x 42′3″; 16½ knots; geared turbines and water tube boilers; 14,500 tons. Launching date November 16, 1940.

Hulls Nos. 1485-1487, three tankers. 502′ x 68′ x 37′; 21,000 tons. Keels laid July 1, August 7 and September 26, 1940. Launching date, No. 1485, March 15, 1941; No. 1486, May 24, 1941.

Hulls Nos. 1488-1491, four tankers for Sinclair Refining Co., 10,700 tons dwt. Keels laid, No. 1488, November 21, 1940; No. 1489, March 18, 1941. Launching date, No. 1488, May 29, 1941.

Hulls Nos. 1492-1493, two tankers for Sinclair Refining Co. 15,450 tons dwt.

Hulls Nos. 1494-1497, four heavy cruisers for U. S. Navy. Keel laying date, No. 1494, May 26, 1941.

Hulls Nos. 1498-1501, four light cruisers for U. S. Navy.

Hulls Nos. 1502-1503, two light cruisers for U. S. Navy.

Hulls Nos. 1504-1507, four heavy cruisers for U. S. Navy.

Hulls Nos. 1508-1511, four aircraft carriers for U. S. Navy.

Hulls Nos. 1512-1515, four trawlers. Keels laid, Nos. 1512-1513, March 26, 1941. **Launching date, No. 1512, June 12, 1941.**

Hulls Nos. 1516-1519, four 1650-ton destroyers for U. S. Navy. Keel laying date, No. 1517, May 20, 1941.

BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Division

Sparrows Point Yard

Sparrows Point, Md.

New Construction:

Hull No. 4343, Robin Kettering; cargo vessel for Seas Shipping Co. LOA 485′, beam 66′, draft 43′. Launching date January 18, 1941.

Hulls Nos. 4347-4348; three C-1 cargo vessels. LOA 417′, LBP 395′, beam 60′, depth 37′6″. Launching date, No. 4347, March 8, 1941. **Delivery date, No. 4347, June 15, 1941.**

Hulls Nos. 4350-4352, three cargo vessels for Seas Shipping Co. 450′ x 66′ x 34′; 6300 hp; 8500 gross tons. Keel laying dates, No. 4351, December 12, 1940; No. 4352, January 22, 1941. **Launching date, No. 4350, May 17, 1941.**

Hulls Nos. 4353-4356, four oil tankers for Socony Vacuum Oil Co. 487′6″ x 68′ x 37′; 12,000 hp, 9800 gross tons. Keel laying dates, No. 4353, August 12, 1940; No. 4354, September 12, 1940; No. 4355, April 21, 1941. Launching date, No. 4353, April 15, 1941.

Hull No. 4357, oil tanker for Union Oil Co. of Calif. 442′ x 63′ x 34′10″; 3500 hp; 8000 gross tons. Keel laying date, December 26, 1940.

Hulls Nos. 4358-4359, two oil tankers for Socony Vacuum Oil Co. 487′6″ x 68′ x 37′; 12,000 hp; 9800 gross tons.

Hulls Nos. 4360-4361, two oil tankers for Union Oil Co. 442′ x 64′ x 34′10″; 3500 hp; 8000 gross tons.

Hulls Nos. 4362-4364, three cargo and passenger vessels for Mississippi Shipping Co. 465′ x 65′6″ x 39′9″; 8600 hp; 8300 gross tons.

Hull No. 4365, oil tanker for Richfield Oil Co. 442′ x 64′ x 34′10″; 3500 hp; 8000 gross tons.

Hulls Nos. 4367-4368, two oil tankers for Panama Transport Co. 487′6″ x 68′ x 37′; 7000 hp; 9800 gross tons.

Hull No. 4369, oil tanker for Continental Oil Co. 442′ x 64′ x 34′10″; 3500 hp; 8000 gross tons.

Hulls Nos. 4371-4372, two oil tankers for Gulf Oil Co. 442′ x 64′ x 34′10″.

Hull No. 4373, tanker for Panama Transport Co. 487′6″ x 68′ x 37′; 7000 hp; 9800 gross tons.

Hulls Nos. 4374-4375, two tankers for Union Oil Co. of Calif. 487′6″ x 68′ x 37′; 7000 hp; 9800 gross tons.

BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Division

Staten Island Yard

Staten Island, N. Y.

New Construction:

Hulls Nos. 8018-8019, two C-1-B design cargo vessels for U. S. Maritime Commission.

Hulls Nos. 8021-8022, two destroyers for U. S. Navy.

Hulls Nos. 8023-8029; 8033-8035; ten destroyers for U. S. Navy.

BURGER BOAT CO.
Manitowoc, Wisconsin

New Construction:

One yacht, 65′x16′x8′, Buda diesel engine.

One ferryboat, 110′ x 32′ x 8′, 330-hp Gray diesel engine.

Six 135′ wooden motor mine sweepers for U. S. Navy.

IRA S. BUSHEY & SONS, INC.
Brooklyn, N. Y.

New Construction:

Hull No. 490, tug. 90′; 805-hp F-M diesel. **Delivery date, July, 1941.**

Hull No. 494, tug. 90′; 805-hp F-M diesel. Delivery date, August 15, 1941.

Hull No. 496, tug. 90′; 805-hp F-M diesel. Delivery date, August, 1941.

Hull No. 497, tug. 90′; 805-hp F-M diesel. Delivery date, September, 1941.

Hull No. 498, 156-foot oil tanker. Delivery date, November, 1941.

Hull No. 499, 156-foot oil tanker. Delivery date, January, 1942.

Hull No. 500, wooden drydock section for Bethlehem Steel Co. Delivery date, October, 1942.

MARINE PAINTS FOR EVERY NEED
PACIFIC PAINT & VARNISH CO.
544 Market Street - SAN FRANCISCO - EXbrook 3038

A COMPLETE LINE
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SPECIFIED FOR ALL
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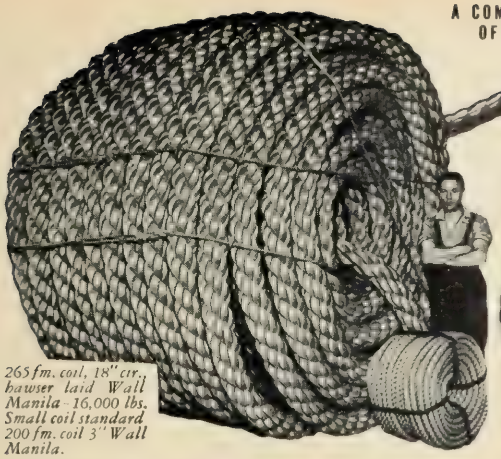

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Heavy duty Marine Cordage, Wrecking Lines, Deep-sea Hawsers, made on the longest rope-walk in the world.

WALL ROPE WORKS, Inc.
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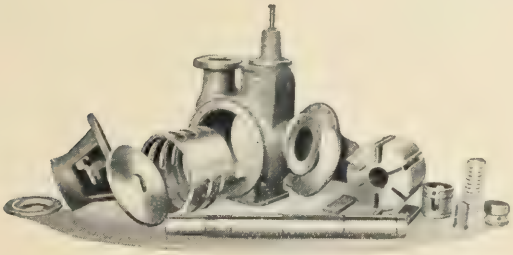

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Fast . . . . Effective . . . . Fool-proof

Buffalo SUPER

Approved Fire Extinguishers

Placed in convenient locations throughout the ships, Buffalo "Supers" provide sure, quick protection against all kinds of blazes on board. Effectively smothers flames with easy pumping action. Designed for years of marine service. Two sizes: 1 qt. and 1½ qt. Approved by the U. S. Bureau of Marine Inspection. Full details on request. Sold by:

Oregon Marine Supply Co.
Portland and Astoria, Ore.

Western Fire Equipment Co.
San Francisco, Calif.

Pacific Marine Supply Co.
Seattle, Wash.

**BUFFALO
FIRE APPLIANCE CORP.**
44 CENTRAL AVENUE, BUFFALO, N. Y.

M. S. American Manufacturer

for eight services depends upon thirteen

WARREN PUMPS

This includes Salt Water Circulating, Bilge, Fresh Water Circulating, Fire, Ballast, Ice Water Circulating, Refrigerator Condenser Circulating and General Service.

For every type of vessel and service you can safely specify "Warren."

WARREN STEAM PUMP COMPANY, INC., WARREN, MASSACHUSETTS

CALUMET SHIPYARD & DRY DOCK CO.

Chicago, Illinois

New Construction:

Hull No. 123, towboat for Ashland Oil & Refining Co., 140′ x 32′ x 9′, 1600-hp diesel engine.

One river towboat for A. L. Meschling Barge Line, 70′ x 20′, 210 hp Superior diesel.

One all-welded Corten steel crawler crane barge, for U. S. Engineers Office, St. Paul, Minn., 66′ x 45′ x 7′.

Four all-welded distribution box boats for Quartermaster Corps., U. S. Army, 65′ x 18′, diesel propelled. Total cost $212,000.

Hull No. 126, all-welded steel towboat for Ashland Oil Refining Co., 145′ x 32′ x 9′, 1600-hp diesel.

CHARLESTON SHIPBUILDING & DRYDOCK COMPANY

Charleston, South Carolina

New Construction:

Six 205′ mine sweeping fleet tugs. Delivery for all within 26 months.

CONSOLIDATED SHIPBUILDING CORP.

Morris Heights, N. Y.

New Construction:

One 100′ all-welded steel diesel tug, Y148, for U. S. Navy.

Seven 165′ steel submarine chasers for U. S. Navy.

CONSOLIDATED STEEL CORP. OF TEXAS

Orange, Texas

New Construction:

One steel oil barge for Sears Oil Co., 196′ x 40′ x 13′.

Two oil barges for C. F. Pillot, 165′ x 36′ x 10′3″.

Six all-welded steel oil barges for Inland Waterways Corp., 196′ x 35′ x 10′6″.

One drilling barge for Shell Oil Co., Inc., 118′ x 44′ x 10′.

One boiler barge for Shell Oil Co., Inc., 90′ x 30′ x 10′.

CRAMP SHIPBUILDING COMPANY

Philadelphia, Pa.

New Construction:

Six cruisers, Cleveland class, for U. S. Navy.

DEFOE BOAT & MOTOR WORKS

Bay City, Mich.

New Construction:

Hull No. 167, PC452, sub-chaser for U. S. Navy. 174′ long Delivery date, September, 1941.

Hulls Nos. 171-174, four mine sweepers for U. S. Navy, 220′ long.

Twelve 165-foot escort vessels for U. S. Navy.

Eight 175-foot sub-chasers for U. S. Navy.

THE DRAVO CORPORATION

Engineering Works Division

Pittsburgh, Pa., and Wilmington, Del.

New Construction:

Hulls Nos. 1789-1790, two sand and gravel barges for Keystone Sand Division. 135′ x 27′ x 8′; 510 gross tons.

Hulls Nos. 1805-1807, three gate vessels for Bureau S. & A., Navy Dept., Washington, D. C. 930 gross tons.

Hull No. 1834, welded steel oil barge for stock. 195′ x 35′ x 9′9″; 598 gross tons.

Hulls Nos. 1835-1840, six 165′ type PC submarine chasers for U. S. Navy, Washington, D. C. 2010 gross tons.

Hulls Nos. 1843-1845, three double-bottom covered cargo barges for stock. 175′ x 26′ x 11′; 1590 gross tons.

Hulls Nos. 1850-1853, four steel lighters for U. S. Navy Dept., Washington, D. C. 110′ x 34′ x 11′3″; 1336 gross tons.

Hulls Nos. 1856-1861, six sand and gravel barges for Keystone Sand Division. 135′ x 27′ x 8′; 1530 gross tons.

Hulls Nos. 1862-1867, six welded steel oil barges for stock, 195′ x 35′ x 9′9″; 3588 gross tons.

Hulls Nos. 1868-1869, two 25-ton floating cranes, one each to Phil. and Norfolk U. S. Navy Yards, for U. S. Navy Dept., Washington, D. C.; 670 gross tons.

Hulls Nos. 1870-1875, six welded steel deck barges for Delaware, Lackawanna & Western R. R., 100′ x 30′ x 9′6″; 1392 gross tons.

Hulls Nos. 1876-1877, two floating caisson gates for U. S. Navy, Philadelphia Navy Yard; 2330 gross tons.

Hulls Nos. 1881-1902, twenty-two welded hopper barges for Pittsburgh Coke & Iron Co.; 175′ x 26′ x 11′; 10,384 gross tons.

Hull No. 1903, floating caisson gate for U. S. Navy, Norfolk Navy Yard; 1330 gross tons.

Hulls Nos. 1904-1906, three welded sand and gravel barges for Cumberland River Sand Company; 130′ x 24′6″ x 6′6″; 579 gross tons.

Hulls Nos. 1907-1911, five 165′ type AM mine sweepers for Bureau Supplies & Accounts, U. S. Navy Dept., Washington, D. C.; 1675 gross tons.

Hulls Nos. 1912-1916, five 165′ type PC submarine chasers for Bureau of Supplies & Accounts, U. S. Navy Dept., Washington, D. C.; 1675 gross tons.

Hulls Nos. 1919-1920, two type W-7 welded bulk cargo barges for stock; 175′ x 26′ x 10′8″; 944 gross tons.

Hull No. 1927, fabricated steel hull for oil barge. 165′ x 35′ x 10′; 502 gross tons.

Hulls Nos. 1928-1933, six welded steel deck barges for Delaware, Lackawanna & Western R. R., New York City. 100′ x 30′ x 9′6″; 1392 gross tons.

Hulls Nos. 1934-1945, twelve welded steel oil barges for stock; 195′ x 35′ x 9′9″; 7176 gross tons.

Hulls Nos. 1946-1955, ten W-7 welded steel coal barges for stock; 175′ x 26′ x 11′; 4720 gross tons.

Hull No. 1957, 25-ton floating crane for Charleston, S. C. Navy Dept., Washington, D. C.; 335 gross tons.

ELECTRIC BOAT COMPANY

Groton, Conn.

New Construction:

Two submarines, SS206, Grampus; SS208, Grayback; for U. S. Navy. Cost $2,937,000 each. Keels laid, Grampus, February 4, 1940; Grayback, April 3, 1940.

One submarine, SS204, Mackeral, for U.S. Navy. Keel laid October 6, 1939. Launched September 28, 1940.

Three submarines, SS212, Gato; SS213, Greenling; SS214, Grouper; for U. S. Navy. Cost $2,957,000. Keels laid, Gato, October 5, 1940; Greenling, November 12, 1940.

Thirteen submarines, SS215, Growler; SS216, Grunion; SS217, Guardfish; SS218, Albacore; SS219, Amberjack; SS220, Barb; SS221, Blackfish; SS222, Bluefish; SS223, Bonefish; SS224, Cod; SS225, Cero; SS226, Corvina; SS227, Darter. Cost $2,795,000 each.

Twenty-five submarines, SS240-SS264.

THE FEDERAL SHIPBUILDING AND DRY DOCK COMPANY

Kearny, N. J.

New Construction:

Hulls Nos. 168-169, CL51, Atlanta; and CL52, Juneau; two 6000-ton cruisers for U. S. Navy. Keels laid April 22 and May 27, 1940.

Hulls Nos. 179-186, eight C-2 cargo ships for U. S. Maritime Commission. Keel laid, No. 179, December 27, 1940; No. 180, April 17, 1941. Launching date, No. 179, May 29, 1941.

Hull No. 188, cargo vessel for Matson Navigation Co. Keel laid November 22, 1940. Launching date, April 12, 1941. **Delivery date, May 19, 1941.**

Hulls Nos. 190-193, four tankers for Sinclair Refining Co. 15,000 dwt. Keel laid, No. 190, November 12, 1940; No. 191, April 17, 1941. **Launching date, No. 190, June 7, 1941.**

Hulls Nos. 194-197, four destroyers for U. S. Navy. Keels laid, Nos. 194-195, December 2, 1940; Nos. 196-197, December 16, 1940.

Hulls Nos. 198-203, six destroyers for U. S. Navy.

Hulls Nos. 204-205, two destroyers for U. S. Navy.

Hulls Nos. 206-213, eight destroyers for U. S. Navy.

Hulls Nos. 214-218, five destroyers for U. S. Navy.

Hulls Nos. 219-221, three cruisers for U. S. Navy.

Hulls Nos. 222-227, six destroyers for U. S. Navy.

Hull No. 228, one C-2 cargo ship for U. S. Maritime Commission. Keel laid, February 10, 1941.

Hulls Nos. 229-230, two destroyers for U. S. Navy.

Hulls Nos. 231-232, two destroyers for U. S. Navy.

Hulls Nos. 233-240, eight cargo ships for the U. S. Maritime Commission.

Twenty-four C-2 cargo vessels.

GREAT LAKES ENGINEERING WORKS

River Rouge, Michigan

New Construction:

Hulls Nos. 287-289, three bulk freighters for Pittsburgh S. S. Co. 640′ x 67′ x 35′; 18,000 dwt; 4000-hp steam turbine engines.

HENRY C. GREBE & CO., INC.

Chicago, Illinois

New Construction:

One 70′ twin-screw diesel cruiser yacht.

Two 135′ mine sweepers for U. S. Navy.

GREENPORT BASIN & CONSTRUCTION CO.

Greenport, L. I., N. Y.

New Construction:

Four coastal mine sweepers, AMC46-49, for U. S. Navy.

Four coastal mine sweepers, AMC61-64, for U. S. Navy.

Twelve 135′ motor mine sweepers for U. S. Navy.

GULFPORT BOILER & WELDING WORKS, INC.

Port Arthur, Texas

New Construction:

Hulls Nos. 167-168, two diesel-electric tugs for General Motors Corp. 100′ x 24′ x 12′4″; 1000 shp G. M. diesel and auxiliary each. **Delivery dates, No. 167, June 2, 1941; No. 168, July 5, 1941.**

Hull No. 176, diesel tug for General Motors Corp. 100′ x 24′ x 12′4″; 680 hp. Delivery date, July 30, 1941.

Hulls Nos. 185-187, three oil barges for Butcher-Arthur Corp., Houston, Texas. 165′ x 36′ x 10′9″. **Delivery dates, No. 185, July 15; No. 186, July 30;** No. 187, August 15, 1941.

Hull No. 189, diesel tug for General Motors Corp. 100′ x 24′ x 12′4″; 680 hp. Delivery date, September 5, 1941.

GULF SHIPBUILDING CORP.

Chickasaw, Ala.

New Construction:

Four 2100-ton destroyers for U. S. Navy.

Four vessels for Waterman Steamship Corporation. 445′ x 63′ x 40′6″; shelter deck type; geared turbine drive; 15½ knots service speed.

THE INGALLS SHIPBUILDING CO.

Pascagoula, Miss., and Decatur, Ala.

Pascagoula

New Construction:

Hull No. 256; C-3 cargo vessel. Completion date, June 1, 1941.

Hulls Nos. 268, 297-299, four C-3-IN passenger-cargo vessels for U. S. Lines. Completion dates, May, November, December, 1942; and February, 1943.

Hulls Nos. 265-267, three C-3-P passenger-cargo vessels for American-South African Line, Inc. Completion dates, November, December, 1941; and January, 1942.

Hulls Nos. 293-296, four C-3-S-A-2 cargo vessels for U. S. Maritime Commission. Completion dates, February, March, May and June, 1942.

Six C-3 cargo vessels.

Decatur

New Construction:

Hull No. 309, landing barge for Government of Venezuela. 295′ x 49′3″ x 7′6″; barge No. 1. **Delivery date, July 1, 1941.**

Hull No. 310, landing barge for Government of Venezuela. 147′6″ x 34′6″ x 7′6″; barge No. 2. **Delivery date, July 1, 1941.**

Hull No. 311, landing barge for Government of Venezuela. 60′ x 34′6″ x 5′; barge No. 3. **Delivery date, July 1, 1941.**

Hull No. 312, ferry float and ramp for Government of Venezuela. 24′ x 30′ x 5′. **Delivery date, July 1, 1941.**

Hulls Nos. 313-314, two sand and gravel barges for stock. 110′ x 26′ x 6′6″. Delivery date, August 15, 1941.

Hulls Nos. 315-317, three 39,000-bbl oil barges for Eddie Erlbacher, Cape Girardeau, Mo. 195′ x 35′ x 9′9″.

Hulls Nos. 318-319, two deck barges for West Virginia Pulp and Paper Co., N. Y. 105′ x 32′ x 7′.

Hulls Nos. AN 1-4, four net layers for U. S. Navy.

GEORGE LAWLEY & SON CORP.

Neponset, Mass.

New Construction:

Twelve 45′ tank lighters for U. S. Navy.

Two 127′ fish trawlers for Booth Fisheries Co. Diesel powered.

Five boats for repair work for U. S. Navy.

Ten 165′ submarine chasers for U. S. Navy.

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Builders of
MERCHANT AND NAVAL VESSELS

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Cable Address:
"LASHIPCO"

LEVINGSTON SHIPBUILDING CO.

Orange, Texas

New Construction:

Hull No. 185, ocean tug for U. S. Navy; 135′ x 30′ x 17′6″.

Hulls Nos. 194-195, two tugs for stock. 66′ x 17′ x 8′; 300-hp Atlas diesel.

Hull No. 196, tug for Sabine Transportation Co., Port Arthur, Texas. 74′ x 20′ x 9′; 400-hp diesel.

Hull No. 198, oil barge for Sabine Transportation Co. 205′ x 40′ x 9′6″ x 10′10″.

Hulls Nos. 200-201, two barges for U. S. Navy. 173′ x 8′6″ x 39′.

Hulls Nos. 202 and 206, two tugs for Pan American. 74′ x 20′ x 9′; 400-hp. Atlas diesel.

Hull No. 203, 85′ coastwise tug for stock. 85′ x 24′ x 9′11″; 600-hp Atlas diesel.

Hulls Nos. 204-205; 207 and 210; four 8500-bbl oil barges for Pan American.

Hulls Nos. 211-212, two tugs for stock. 105′ x 25′ x 13′6″; 1000-hp General Motors diesel.

Hulls Nos. 213-215, three tugs for stock. 85′ x 23′ x 9′9″; 600-hp Superior diesel.

MANITOWOC SHIPBUILDING CORP.

Manitowoc, Wisconsin

New Construction:

Ten submarines, SS265-274, for U. S. Navy.

One streamlined passenger and auto carrier, Milwaukee Clipper, for Sand Products Corp. 361′ x 45′ x 28′.

MARIETTA MANUFACTURING CO.

Point Pleasant, W. Va.

New Construction:

Hull No. 419, one steam stern-wheel towboat for stock. 167′ x 37′6″ x 8′2″.

Hulls Nos. 455-456, two all-welded steel bulk oil barges for stock. 195′ x 35′ x 10′.

Hull No. 457, all-welded steel fuel oil barge for stock. 135′ x 26′ x 9′.

Four net tenders, YN13-16, for the U. S. Defense Commission. Total cost $2,040,000. Launching dates, March 20, April 17, **June 19, July 2, 1941.**

Eight all-steel steam propelled mine planters for the U. S. Army. Cost $8,241,750. Keel laying dates, May 15 and 16, 1941.

MARINE IRON & SHIPBUILDING COMPANY

Duluth, Minnesota

New Construction:

Hull No. 70, 180′ cutter of "Cactus" type for U. S. Coast Guard. Total cost $673,299.

JOHN H. MATHIS CO.

Camden, N. J.

New Construction:

Four anti-submarine net tenders for U. S. Navy.

One bulk carrier tanker 265′ long for Thos. Bowes, N. A.

MIAMI SHIPBUILDING CORP.

Miami, Florida

New Construction:

Two 54′ wooden hull motor torpedo boats for U. S. Navy, PT1-2. Cost $89,875. Keels laid, July 12, August 19, 1939. Launching dates, August 16, September 30, 1939.

Eleven high-speed, off-shore patrol boats.

Six 30′ Harbor Communication boats.

NEWPORT NEWS SHIPBUILDING & DRYDOCK CO.

Newport News, Va.

New Construction:

Hull No. 378, battleship 58, Indiana, for U. S. Navy. Keel laid November 20, 1939.

Hulls Nos. 383-384, two single screw combination passenger and cargo vessels for U. S. Maritime Commission. 465′ x 69′6″ x 42′6″; gross tonnage about 9100 tons. **Delivery date, No. 383, June, 1941;** No. 384, September, 1941.

Hull No. 385, aircraft carrier No. 8, Hornet, for U. S. Navy. Launched December 14, 1940.

Hull No. 386, single-screw combination passenger and cargo vessel for U. S. Maritime Commission. 465′ x 69′6″ x 42′6″; gross tonnage about 9100 tons. Delivery date, October, 1941.

Hull No. 389, one single-screw cargo vessel for International Freighting Corp., Inc. 435′ x 63′ x 40′6″; gross tonnage about 8000. Delivery date, August 1, 1941.

Hulls Nos. 390-391 (CL62-CL63), two light cruisers for U. S. Navy.

Hulls Nos. 392-394 (CV9-CV11), three aircraft carriers for U. S. Navy.

Hulls Nos. 395-398 (CV12-CV15), four aircraft carriers for U. S. Navy.

Hulls Nos. 399-400 (CL80-CL81), two light cruisers for U. S. Navy.

THE NEW YORK SHIPBUILDING CORPORATION

Camden, N. J.

New Construction:

BB57, South Dakota, battleship for U. S. Navy. Keel laid July 5, 1939.

AR5, Vulcan, repair ship for U. S. Navy. Keel laid December 26, 1939.

CL55, Cleveland; and CL56, Columbia; two cruisers for U. S. Navy. Order placed March 23, 1940.

CL57 and CL58, two cruisers for U. S. Navy. Order placed June 12, 1940.

AV7, Currituck, seaplane tender for U. S. Navy.

CL59-CL61, three cruisers for U. S. Navy.

CB1-CB6, six cruisers for U. S. Navy.

CL76, four cruisers for U. S. Navy.

NORTH CAROLINA SHIPBUILDING CO.

Wilmington, N. C.

New Construction:

Thirty-seven all-welded steel EC-2 cargo ships for U. S. Maritime Commission.

THE PUSEY & JONES CORP.

Wilmington, Del.

New Construction:

Hulls No. 1080, New York; No. 1081, Florida, two automobile and passenger ferries for Delaware-New Jersey Ferry Co. 206′ x 65′ x 16′; 750 gross tons; Una-Flow steam machinery; 1400 shp; 15 mph speed. Launching date, February 1, 1941. **Completion dates, No. 1080, May 15, 1941; No. 1080, June, 1941.**

Hulls Nos. 1082, Hains; and 1083, Hoffman; two seagoing hopper dredges for War Dept., U. S. Engineers Office, Philadelphia, Pa. 215′10½″ x 40′ x 15′6″; approx. 2000 gross tonnage; diesel-electric propulsion, 950 shp. Delivery dates, February and August, 1942.

Ten C-1 cargo vessels.

R. T. C. SHIPBUILDING CORP.

Camden, N. J.

New Construction:

Hull No. 134, 600-ton motor tanker, George Whitlock. 155′ x 30′ x 13′3″.

Hull No. 135, 600-ton motor tanker, F. W. Lloyd. 155′ x 30′ x 13′2″.

Hull No. 136, 1700-ton motor tanker, T. W. Drennan. 260′ x 42′ x 18′.

Hull No. 137, 995-ton motor tanker. 190′ x 36′ x 12′.

Hulls Nos. 138-139, two 985-ton motor tankers. 190′ x 36′ x 12′.

SUN SHIPBUILDING AND DRY DOCK COMPANY

Chester, Pa.

New Construction:

Hulls No. 186, Rio Hudson; No. 187, Rio Parana; No. 188, Rio de la Plata; No. 189, Rio de Janeiro; four C-3 cargo and passenger liners for Moore-McCormack Lines. 492′ x 69′6″ x 42′6″; 8500 gross tons; diesel propelled; 8500 shp; 16½ knots. Delivery dates, August, Stepember, October and November, 1941.

Hulls Nos. 199-206, eight C-2 cargo vessels for U. S. Maritime Commission. 474′ x 63′ x 40′6″; 7400 gross tons; diesel propelled; 7500 shp; 16 knots. **Launching dates,** No. 199, May 24; **No. 200, June 21; No. 201, July 21;** No. 202, September 6; No. 203, October 4; No. 204, November 11, 1941; Nos. 205-206, 1942. **Delivery dates, No. 199, July;** No. 200, August; No. 201, September; No. 202, November; No. 203, December, 1941; Nos. 204-206, 1942.

Hulls Nos. 208-210, three tankers for Petroleum Shipping Co. 520′ x 68′ x 37′; 10,400 gross tons; turbine; 4000 shp; 13 knots. **Launching dates,** No. 208, March 29; No. 209, May 10; **No. 210, June 9, 1941. Delivery dates, No. 208, June 13;** No. 209, August; No. 210, September, 1941.

Hulls Nos. 213-216; 219-220, six tankers for Panama Transport Co. 547′3″ x 70′ x 40′; 11,400 gross tons; 7500 shp; 15 knots speed. Launching and delivery dates, 1942-1943.

Hulls Nos. 217-218, two tankers for Standard Oil Co. of N. J. 547′3″ x 70 x 40′: 11,400 gross tons; 7500 shp; 15 knots speed Launching dates, No. 217, August 19; No. 218, October 18, 1941. Delivery dates, No. 217, October; No. 218, December, 1941.

Hulls Nos. 221-222, two tankers for Keystone Tankship Corp. 520′ x 68′ x 37′; 10,600 gross tons; turbine; 12,000 shp; 16½ knots. Keel laying dates, November 15 and December 15, 1941. Launching dates, No. 221, November 22, 1941; No. 222, 1942. Delivery dates, No. 221, January, 1942; No. 222, 1942.

Hulls Nos. 223-225, three tankers for The Texas Co. 513′10″ x 68′ x 36′; 9300 gross tons; turbine; 9000 shp; 16 knots. Launching and delivery dates, 1942.

Hull No. 226, tanker for Kaymar Tankship Corp. 520′ x 68′ x 37′; 10,600 gross tons;

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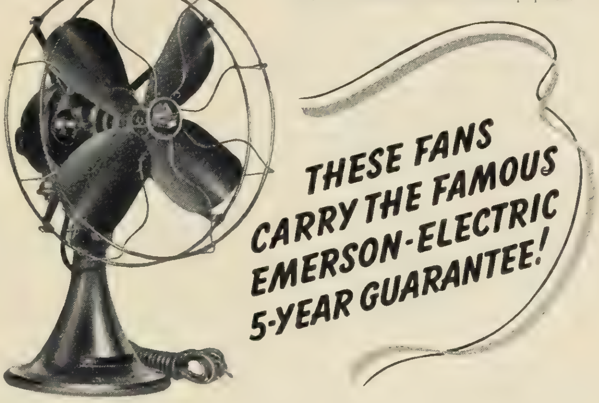

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216

LEADERS IN THE ELECTRICAL INDUSTRY SINCE 1890

turbine; 12,000 shp; 16½ knots. Keel laying date, 1942.

Hulls Nos. 227-228, two tankers for Seamar Tankship Corp. 520′ x 68′ x 37′; 10,600 gross tons; turbine; 12,000 shp; 16½ knots. Keel laying dates, 1942.

Hull No. 229, tanker for Atlantic Refining Co. 543′10″ x 70′ x 40′; 11,600 gross tons; turbo-electric; 5000 shp; 13 knots. Launching date, August 4, 1941. Delivery date, October, 1941.

Hull No. 230, tanker for Atlantic Refining Co. 474′ x 65′ x 37′; 8000 gross tons; turbo-electric; 5000 shp; 14½ knots. Launching date, December 6, 1941. Delivery date, 1942.

Hulls Nos. 231-232, two tankers for Keystone Tankship Corp. 520′ x 68′ x 37′; 10,600 gross tons; turbine; 12,000 shp; 16½ knots. Delivery date, 1942.

Hulls Nos. 233 and 240, two tankers for Gulf Oil Corp. 485′ x 68′ x 36′; turbine propelled; 14½ knots. Delivery dates, December, 1942, and March, 1943.

Hull No. 234, tanker for Sun Oil Co. 547′3″ x 70′ x 40′; 11,400 gross tons; diesel propelled; 7500 shp; 15 knots. Delivery date, 1942.

Hulls Nos. 235 and 237, two tankers for Standard Oil Co. of N. J. 547′3″ x 70′ x 40′; 11,400 gross tons; turbine; 7500 shp; 15 knots. Delivery date, 1942.

Hull No. 236, tanker for Atlantic Refining Co. 543′10″ x 70′ x 40′; 11,600 gross tons; turbo-electric; 5000 shp; 13 knots. Delivery date, 1942.

Hulls Nos. 238-239, two tankers for Standard Oil Co. of Calif. 521′ x 70′ x 40′; turbine propelled; 15½ knots. Delivery dates, January and March, 1943.

Ten C-2 cargo vessels.

TAMPA SHIPBUILDING CO.

Tampa, Fla.

New Construction:

Hulls Nos. 37-40, four C-2 type cargo vessels for U. S. Maritime Commission. 459′ x 63′ x 31′6″; 9291 dwt tons.

TODD-BATH SHIPBUILDING CORP.

Bath, Maine

New Construction:

Thirty cargo vessels for British Purchasing Commission. Cost $50,000,000.

F. B. WALKER & SONS

Pascagoula, Mississippi

New Construction:

One all-welded steel tug for Florida interests. 68′ x 17′ x 8′6″; 300-hp Atlas diesel.

One all-welded steel tug for Colle Towing Co. 75′ x 19′ x 9′; 400-hp Atlas diesel.

One all-welded steel barge, 132′x32′x8′6″.

Two all-welded steel oil barges, 180′x36′ x 9′.

Two steel tugs, 75′ x 19′ x 8′6″.

American Bureau Buys Larger Building

Due to the necessity of securing additional working space, the American Bureau of Shipping has acquired new headquarters through the purchase of the building at 47 Beaver Street, New York City. Its new home is a steel and concrete fireproof building of modern construction, and after alterations have been completed to accommodate the various needs of the Bureau, the transition will be accomplished around April 9th.

America's classification society, now in its 79th year, has been in its present quarters, the Stevenson Taylor Memorial Building, 24-26 Old Slip, since 1927, the building being named in honor of Stevenson Taylor, President of the Bureau from 1916 to 1926. The year 1916 saw the reorganization of the American Bureau of Shipping and 1941 marks the twenty-fifth anniversary of the event. However, this five story building is now proving greatly inadequate in furnishing the facilities necessary to carry on the tremendous volume of work incidental to the expansion of shipbuilding activity at present under way.

The new location, consisting of six floors and mezzanine, will provide 2½ times the floor area of the former building, and the additional space thus available will enable the Technical Department and the Surveyor's Division to carry on their work even more expeditiously than in the past. The Record Department, responsible for compiling and publishing the Bureau's yearly "Record" book, will be occupants of the entire mezzanine floor. The sixth floor will be reserved for the testing of various shipbuilding materials and as a general scientific department.

The Beaver Street building will be thoroughly modern in every respect. Air conditioning of the building will be employed throughout and working equipment will be of the latest type. New lighting fixtures of the fluorescent type have been installed on every floor. This type of lighting will be particularly advantageous over the drawing boards.

As an indication of the increasing volume of work being handled by the Bureau in recent years, it is interesting to note the number of vessels and gross tonnage of same being built to classification requirements on the first of each year from 1938 to date, as follows:

January 1st, 1938—94 vessels, 283,115 gross tons.

January 1st, 1939 — 149 vessels, 583,830 gross tons.

January 1st, 1940 — 238 vessels, 1,167,390 gross tons.

January 1st, 1941 — 283 vessels, 1,551,878 gross tons.

April 1st, 1941—542 vessels, 3,029,325 gross tons.

From the above, it will be noted that the shipbuilding activity in the past three years has resulted in increasing by six times the number of vessels being built to Bureau class and the gross tonnage being handled has increased almost eleven times. In connection with this, a great volume of plans are submitted to the Bureau for approval. Also, in this connection, numerous reports are received daily from the Bureau's surveyors stationed in shipyards, steel mills and engine building plants all over the country. In addition, numerous periodic and damage surveys are conducted on vessels already in existence.

Coast Guard Opens Great Lakes

This spring saw the earliest opening of navigation through the Federal locks at Saulte Ste. Marie, Michigan, in forty years, largely through the efforts of the United States Coast Guard in breaking channels through ice in strategic parts of the Great Lakes, according to an announcement just made by Rear Admiral R. R. Waesche, Commandant, U. S. Coast Guard. April 3rd the first ship passed through the Soo Locks, westbound for Duluth, Minnesota, to load iron ore, and on April 4th 12 additional vessels made the westward passage.

Opening of Great Lakes traffic at this time has been greatly facilitated by the Coast Guard Cutters Tahoma and Escanaba and the car ferry Ste. Marie, under charter to the Coast Guard, and through reconnaissance flights made by Coast Guard aircraft. This is the earliest opening of navigation through the Soo locks since 1901.

New Marine Books

Seamanship, Naval Architecture, Marine Engineering

The editor of Pacific Marine Review will be glad to order any of these books for readers. Address orders to A. J. Dickie, 500 Sansome Street, San Francisco, California, enclosing check or Post Office money order for price of book or books wanted.

Seamanship Studies for Young Officers. A series of six booklets, by Felix Riesenberg, each with an average of 56 pages, 5½x8½", profusely illustrated, bound in heavy blue paper with white stampings, published by D. Van Nostrand Company, Inc. Price for set of six books $5.00 net.

This series was prepared as class material for the United States Maritime Service—the training division of the Maritime Commission. Each booklet contains one lesson, the titles being: Lesson I, Fundamental Seamanship; Lesson II, The Ship; Lesson III, The Bridge; Lesson IV, Boats; Lesson V, Cargo Handling Gear; Lesson VI, Ground Tackle—Weather Lore. At the end of each section there are comprehensive groups of questions for self-examination.

These lessons: are very carefully prepared for their special purpose; contain a wealth of specialized knowledge; have fairly up-to-date illustrations and data; and are probably the most up-to-date compilation on merchant seamanship published in the United States.

Applied Naval Architecture. A series of two booklets by Geo. C. Manning, M.S., B.S., 82 pages total. Same format as "Seamanship Studies" above. Published by D. Van Nostrand. Price $1.50.

George C. Manning is a lecturer in Naval Architecture at the Massachusetts Institute of Technology and the author of Masters and Mates Annual of Naval Architecture. As in the series on seamanship, described above, each booklet comprises one lesson.

Lesson I comprises chapter I, which is entitled "Safety Regulations and Calculations" and includes a section on each of the following subtitles: history; classification; road line regula-

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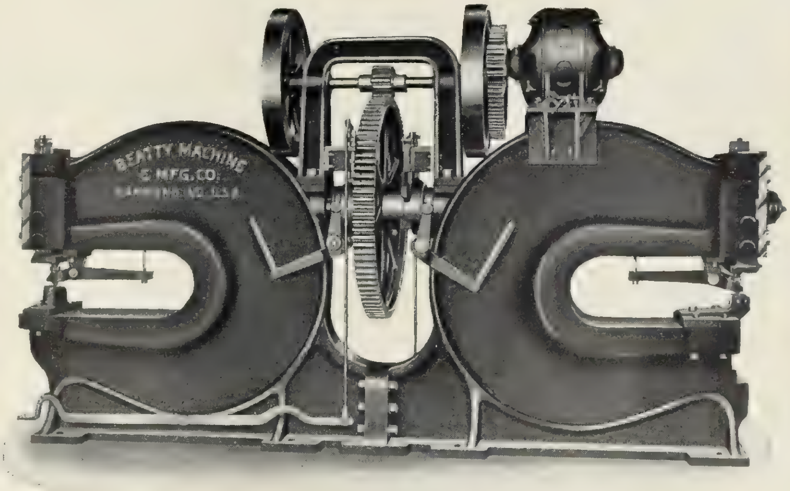

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tions and calculations; floodable length calculations; damaged stability calculations; fire protection regulations.

Lesson II comprises Chapters II and III. Chapter II is on tonnage calculations. Chapter III is on Ship Preservation, with sections on: inspection and testing; methods of preserving hull; drydocks and docking; and special specifications for repairs.

The treatment is quite thorough, tabular data is extensive and the book is well illustrated.

Military and Naval Recognition Book, by Captain J. W. Bunkley, U. S. Navy. 300 pages, 5″ x 7″, profusely illustrated in both black and white and in color plates, bound in blue buckram with aluminum and red stampings, published by D. Van Nostrund Company, Inc., price $2.50 net.

This is the standard American handbook on the organization and insignia of rank of the world's armed forces and on the etiquette and customs of the American services. It was first published in 1920 and is now brought up to date as of January, 1941. It contains complete reliable data and plates covering every branch of military service in the United States, and a section on foreign armies and navies containing all the available and reliable data.

A very handy and interesting collection of information that will be of great interest to practically every American in these war days.

Brown's Practical Pocket Book for Merchant Seamen, by J. M. McKerrell, 294 pages, 5″ x 6″, with numerous diagrams and tables, well-indexed, bound in limp red covers with gold stampings, published by Brown, Son & Ferguson, Ltd. Price $2.00 net.

This is the seventh edition of a popular British handbook for the Merchant Service officer. It contains a vast amount of the data that is found useful in working ship. The information is presented in a concise and yet comprehensive fashion and is arranged and indexed so as to be readily available. Any officer will find this little volume of great help both in his daily calculations and in clinching an argument over the mess table.

Tait's New Seamanship and Nautical Knowledge, by Captain James Tait. 450 pages, 5″ x 7″, illustrated with numerous diagrams, halftones and line cuts, bound in stiff cardboard, published by Brown, Son & Ferguson, Ltd. Price $2.15.

This fourteenth edition of a standard British work has been revised, rearranged and brought up to date by Captain H. T. Jefferys. It is prepared to furnish all the information necessary for passing the latest British Board of Trade Requirements in the Examinations for all grades from 2nd Mate to Extra Master.

Full of useful information for meeting the practical every-day problems of the deck officer in either steamers, motorships or sailing vessels.

Engineering Knowledge for Deck Officers, by F. J. Drover, Eng.-Capt. 270 pages, 8¾″ x 6″, profusely illustrated, bound in red buckram with gold stampings, published by Brown, Son & Ferguson, Ltd. Price $2.15.

This (2nd) 1939 edition brings this treatise fairly up to date. It is a very useful book to the deck officer because without too much technical or mathematical treatment it presents to him an understanding of the propulsion and auxiliary machinery on the modern merchant vessel and the methods by which that machinery is best operated and controlled.

Moore Delivers Mormacsun

(Continued from page 43)

indicated compartment by turning into that compartment carbon dioxide gas from the large battery of Lux CO_2 cylinders.

Emergency Generator Set

The Mormacstar and her sister ships have an emergency generator set installed in a compartment on the boat deck.

In this same compartment is installed the distribution switchboard for the vital circuits, such as ship's navigation lights, radio, and lights in passageways and at boat stations, and these are arranged so that they are automatically transferred to the emergency generator set in case of failure or shutdown of the main generators, which are, of course, located in the engine room and are turbine-driven.

The emergency generator set is a diesel set consisting of a 120/240-volt, 3-wire, compound wound, Electro Dynamic 7.5 kw direct current generator, mounted on a unit cast iron base and driven by a Hill two cylinder, 5 x 7, 4 cycle, mechanical injection diesel engine at 850 rpm. This set is equipped with automatic starting, so that upon any interruption of the main electrical power the emergency set is started. Upon resumption of main power, the load is automatically transferred back to the main generators.

As the Mormacstar and her sister ships depend on motor-driven fuel pumps and the main generator sets are steam turbine-driven, it is obvious that there must be some separate source of power in order to fire up the boilers if steam is once allowed to go down, as might be the case in the long lay-up at some port. There is, therefore, an emergency circuit run back from the emergency generator room to the engine room so as to allow firing up the boilers from a cold start.

The Hill Diesel Engine Company have furnished many hundreds of these sets to the Maritime Commission for C-2 and C-3 vessels. Later installations, such as those on the C-3 ships being built by the Western Pipe and Steel Company and Seattle-Tacoma Shipbuilding Corporation, are using 15 kw emergency generator sets powered by 4 cylinder Hill diesel engines operating at 1200 rpm.

These emergency generator sets and the automatic starting equipment were furnished through the King-Knight Company of San Francisco, who have specialized for many years in the manufacture of diesel, gas and gasoline, and steam driven generator sets.

COEN

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Have given 100% satisfactory service for over 25 years in hundreds of marine installations.

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It pays to have the protection of Mundet "Jointite" Corkboard and Moulded Cork Pipe Covering in storage terminals and refrigerated spaces aboard ship. This low temperature insulation gives dependable protection against heat infiltration. Economical, long-lasting, it is easily adaptable to individual requirements. Our engineering staff will be glad to help with specifications.

- **HIGH TEMPERATURE . . .**

We carry a full line of K & M asbestos and magnesia insulating products for marine requirements. K & M insulation, made by Keasbey & Mattison, assures highest efficiency and maximum power savings in high temperature operation. For full information on either low or high temperature insulation, write to the nearest Mundet office.

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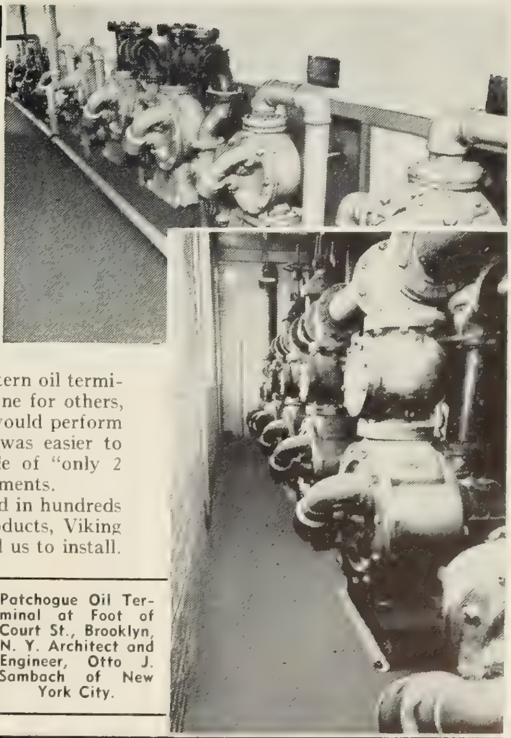

Patchogue Oil Terminal at Foot of Court St., Brooklyn, N. Y. Architect and Engineer, Otto J. Sambach of New York City.

VIKING PUMP CO. CEDAR FALLS IOWA

Keep Posted

Recent Developments in Ship, Shipyard, Dock, and Shop Machinery and Equipment

New Hydraulic Press For Coast Shipyard

Prominent among Southern California shipyards where activity has accelerated in recent months, is the Bethlehem Steel Company's Shipbuilding Division, San Pedro Yard, Terminal Island, contiguous to Los Angeles harbor.

Recently, this yard ordered from the Madsen Iron Works of Huntington Park, a complete 60-ton hydraulic press, to be used principally for pipe bending. Water will be the operating medium. In order to assure all parts—cylinder, head, ram, gland and even the massive base—withstanding the severe recurring strains to which this press will be subjected in service, a nickel-chromium molybdenum alloyed iron with a minimum tensile strength of 45,000 psi was selected by Madsen, who designed the machine. The use of nickel in seven tons of these castings resulted further in effecting good machinability.

In conformance with modern foundry technique employed at Madsen Iron Works, the iron was ladle-inoculated with ferro-silicon. "C" test bar was poured, per ASTM standards, giving test results shown herewith:

At the same time the above arbitration bar was poured, to another test-bar ladle was added sufficient "F" nickel shot and ferro-chromium to bring the analysis up to about 2.00 per cent nickel and 0.75 per cent chromium for purpose of securing a sample test-bar for a prospective purchaser.

Transverse Test (2.00″ Diameter Bar—24″ Centers)		*Analysis*	
Load, lbs.	10,600	T.C.	3.00%
Deflection, inches	0.56″	Ni	0.86
Tensile (Breaking Section Machined to 1.25″)		Cr	0.19
PSI	47,950	Mo	0.32

When this latter bar was tested the following results were attained:

Transverse Test ("C" Bar, 2.00″ Diameter—24″ Centers)	
Load, lbs.	12,970
Deflection, inches	0.56″
Tensile	
PSI	69,330

The operating cylinder of the hydraulic press, when finish-machined and honed inside, exhibited a mirror-like finish which presents an extremely smooth surface on which the piston may operate without leakage.

* * *

Greene, Tweed & Co. In New Quarters

Greene, Tweed & Co., manufacturers of Palmetto and other brands of packings and special tools, have moved their manufacturing plants and general offices to the Palmetto Bldg. at Bronx Boulevard and 238th St., near Woodlawn in New York City.

The new Greene, Tweed headquarters are located in a large modern plant, exceptionally attractive in appearance and practical in layout. Ample room is available for all departments and for increased manufacturing facilities. The plant is immediately adjacent to tracks of the New York Central and New Haven railroads, thereby providing convenient shipping accommodations.

New and modern machinery has been installed for manufacturing processes and to provide for the additional lines of packings and other new products which are being developed. This move is in line with the steady growth of this 78-year old company, which has long been a leader in its field, after pioneering in the manufacture of self-lubricated packings for all services.

* * *

55 LIBERTY SHIPS

(Continued from page 35)

Officers of the California Shipbuilding Corporation include S. D. Bechtel, president; John A. McCone, vice president and general manager; Ralph M. Parsons, Henry J. Kaiser, R. J. Lamont, J. A. MacEachern and Joseph Haag, Jr., vice presidents; and K. K. Bechtel, secretary treasurer.

Every human activity in this world of ours has its theme song for those with ears tuned to hear. So it is down at "Calship" on Terminal Island.

Walk along Dock Street some evening about sunset. Look across the shipyards to where the great shipways are rising, eleven of them completed, fourteen of them all in a row. There you will see a veritable forest of piles, like the pipes of a giant organ, on the last of which the chuffing, thumping pile drivers are playing a symphony of the project—free men at work that men may remain free.

Are your vessels affected by these deck-glue problems—Does hot weather cause softening and running over the seams? Does cold weather cause a brittle dryness? If you are bothered with these or other deck-repair problems, write for FREE data on how to solve them economically, efficiently.

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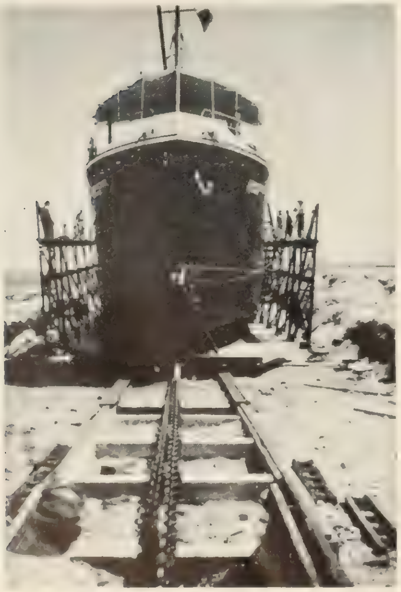
Naval Dockyard Facilities in Venezuela

The Venezuelan Government is creating a new naval base at Puerto Cabello. This old port is one of the early points of settlement in the new world and has been a haven since the days of the Conquistadores.

In 1937, drydocking equipment at the yard was limited to a single 180′ x 80′ section of an originally two-section, composite floating drydock. Toward the latter part of 1937 the Venezuelan Ministry of War engaged the Crandall Dry Dock Engineers, Inc., to make an investigation and report concerning the present facilities and probable future requirements. In April, 1938, after a month of study of the situation at Puerto Cabello by J. Stuart Crandall, this firm submitted recommendations for expanding the dockyard on the area northeast of the existing one by constructing there a new forge shop, machine shop, woodworking shop, quay walls, drydocks and appurtenances. Reorganization of operations was also recommended.

Early in 1939 the Ministry of Public Works, acting for the Ministry of War, engaged the same firm as consulting engineers to prepare plans and specifications for these new shops, quay walls, and a 5000-6000-ton floating drydock; also to design and construct a 500-ton railway drydock. Upon completion of the designs for the 5000-6000-ton floating drydock, the Ministry of Public Works requested bids but because of general conditions construction was postponed.



The first unit in the dockyard development program was the 500-ton railway drydock. This was logical because vessels of this tonnage make up a rather large proportion of the number entering the port. This dock was completed in February, 1940.

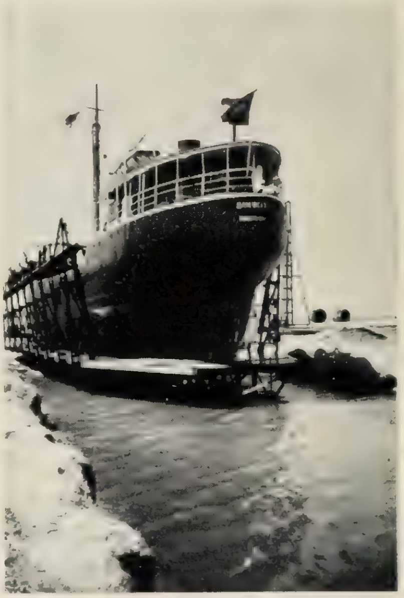
Its site, in a land-locked harbor—ideally free from large waves and ground swell—is just north of the original yard on recently reclaimed land of sufficient area to permit considerable future expansion. The installation consists of a cradle which travels on a system of free rollers over a two-way track, whose gradient is an arc of a vertical circle. The principal dimensions and general description follow.

Dimensions

Length over keel blocks	131.2 ft.
Length overall	142.6 ft.
Width over cross beams	37.7 ft.
Width clear	31.2 ft.
Length of track	367.3 ft.
Depth water over keel blocks, fwd.	8.2 ft.
Depth water over keel blocks, aft.	13.1 ft.

The Cradle

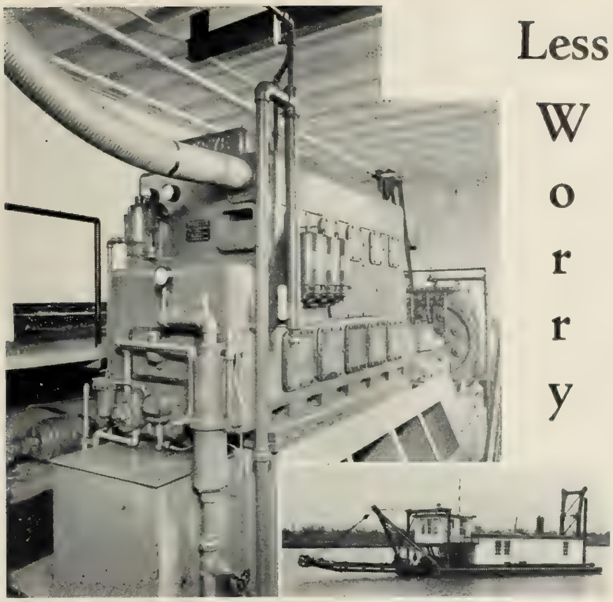
The cradle is built of structural steel throughout, except for the deck, docking platform and blocking. Its underbody consists of two vertical and parallel runners, to the under side of which are riveted steel rail plates. Beams carrying the keel and bilge blocks, as well as the deck, are framed transversely over the runners. The deck, or working platform, covers the entire length of the cradle full width and extends beyond the keel blocks at the after end to facilitate repairs to propellers and rudders. On both sides of the cradle are docking platforms supported by steel uprights fastened to the transverse beams. From these docking platforms, vessels are centered and blocked through the use of hand winches which operate the seven sliding blocks on each side of the cradle.



Tracks

The tracks are the two-way type, 367.3 feet long, constructed on an arc of a circle, so that the cradle is horizontal when in the upper or "hauled up" position. The in-shore portion of the track, above low water, is of reinforced concrete, while the out-shore or submerged portion is of wood, protected against marine borers. Both sections are supported on long timber piling driven deeply into coral, dense sand and silt to a firm bearing.

After these piles were driven, they were cut off under water along the line of proper curvature. Meanwhile, the



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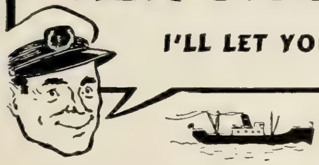
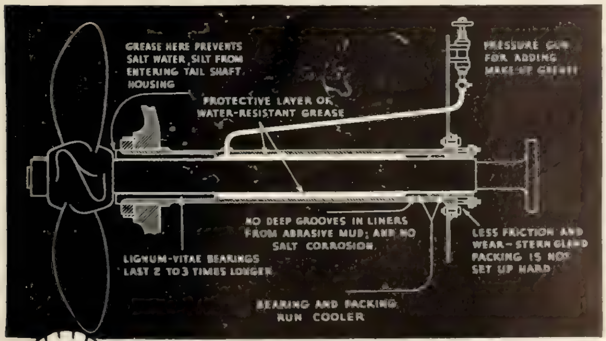


Shell Stern Tube Lubrication seals the shaft with a collar of water-resistant grease (see plan below). This keeps the well dry — and lubricates *and cools* the bearings much better than sea water ever did.

Lignum vitae bushings, when lubricated by this method, last about 3 times as long as before. You save on repairs, on laid-up time, and on dry-dock expense, as owners of more than 700 West Coast craft can tell you.

For information, phone nearest Shell office or write to Industrial Lubricants Division, Shell Building, San Francisco, Calif.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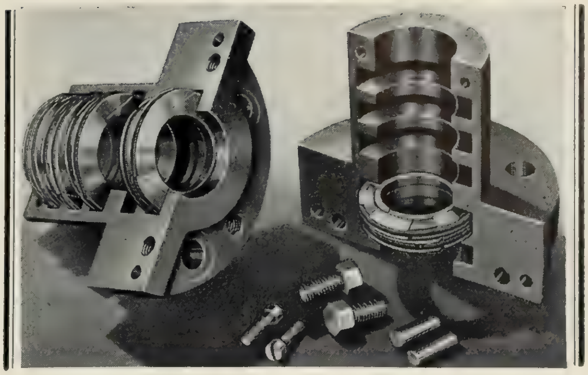

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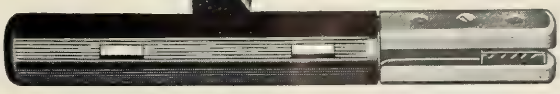

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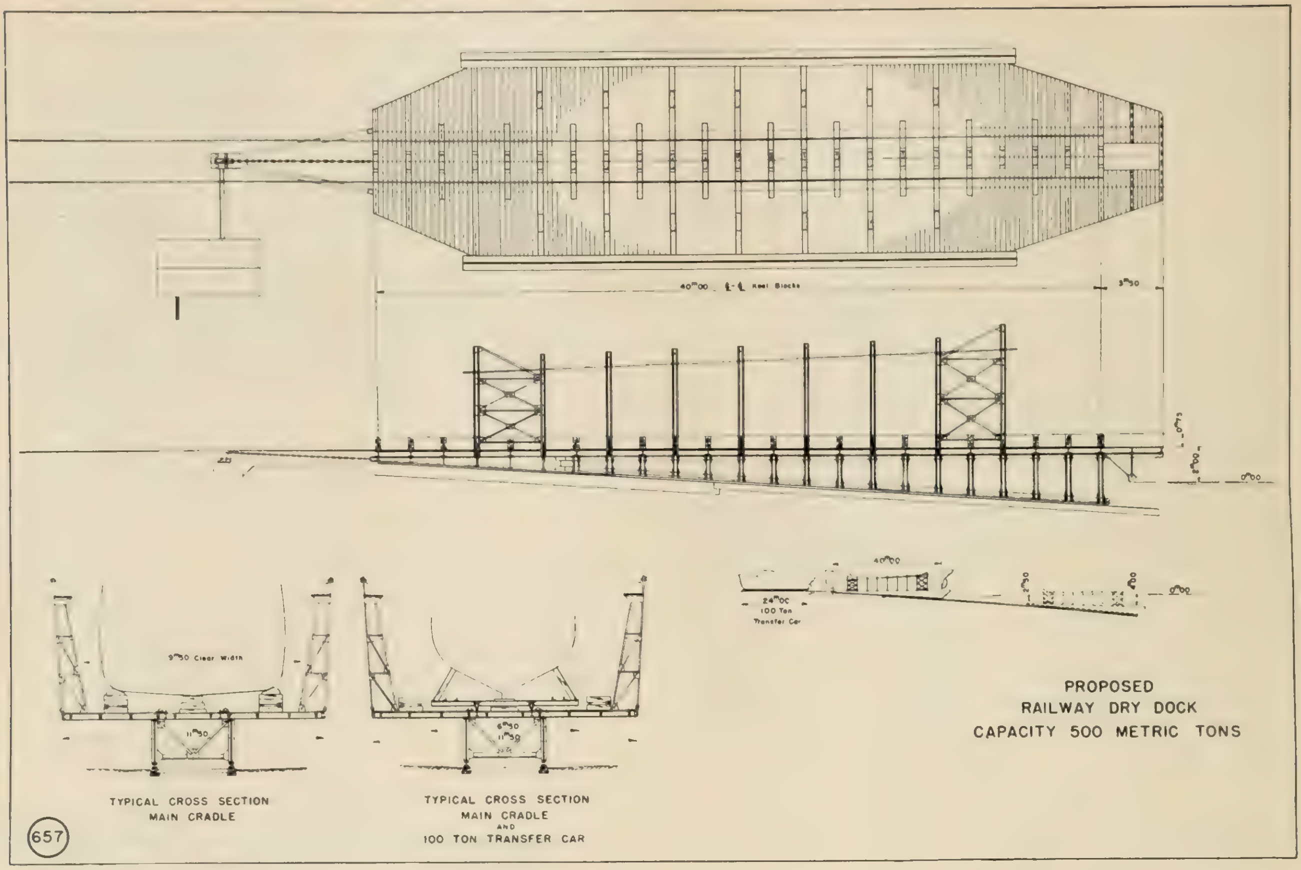

PROPOSED
RAILWAY DRY DOCK
CAPACITY 500 METRIC TONS

wood track was constructed as a unit ashore, floated over the piles, sunk in place, carefully aligned and then fastened permanently by the diver.

The cradle moves over this track on a system of free rollers of alloy steel. The lower surfaces of the cradle runners and the upper ones of the track are equipped with flat steel plates between which these rollers operate. By this means, the friction is minimized and there is no need of lubrication.

Hauling Mechanism

The cradle is operated by a single hauling chain arranged on an endless system, operated by an electric hauling machine, sufficiently powerful to haul a capacity load in about 15 minutes. The hauling chain, of heat-treated, manganese steel, without welds, passes over a toothed sprocket wheel on the main shaft and then back along the track, where the lower end is attached to a smaller backing chain. This backing chain passes through a submerged sheave and returns on itself to a fastening on the cradle. The machinery has two speeds: high, for hauling less than capacity loads; low, for capacity loads.

Auxiliary Cradle and Storage Tracks

When in its upper position, the cradle is horizontal, as we have pointed out. Along the top of the cradle are longitudinal rails, making it possible to drydock and haul ashore to temporary storage, on an auxiliary cradle, small vessels weighing up to 100 tons. This transfer cradle is mounted on wheels and moves along the rails on top of the main cradle to an adjoining system of tracks ashore at the head of the railway drydock. Thus, two or more ships may be served simultaneously; while the transfer cradle is on the storage track, the main cradle is an independent unit.

This 500-ton railway drydock was designed, constructed and installed by the Crandall Dry Dock Engineers, Inc. of Cambridge, Massachusetts. In 1940, the Venezuelan Ministry of Public Works engaged this same company to design and construct a 1500-ton railway drydock at Puerto Cabello. This is now under construction, and will be described later as "Part II" of this article.

Thus, the Puerto Cabello Naval Base will become one of the most up-to-date yards in the Caribbean. Construction is being developed under the responsibility of the Minister of Public Works, Doctor E. J. Aguerreverre, in direct charge of the Director of Means of Communication, Doctor F. J. Sucre and the district engineer, Doctor Ramon Valery. Operation of the yard will be under the Minister of War, General Isais Medina, and the Director of the Naval Arsenal, Dr. Manuel Silveira.

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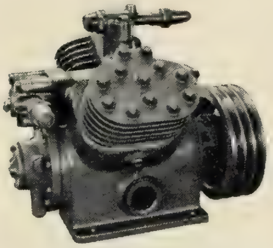

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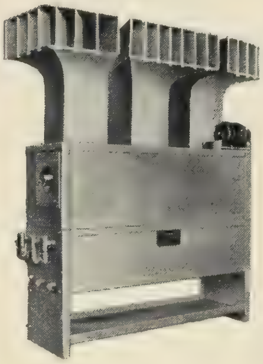

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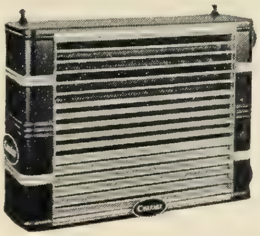

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Marine Turbine Deliveries Ahead of Schedule

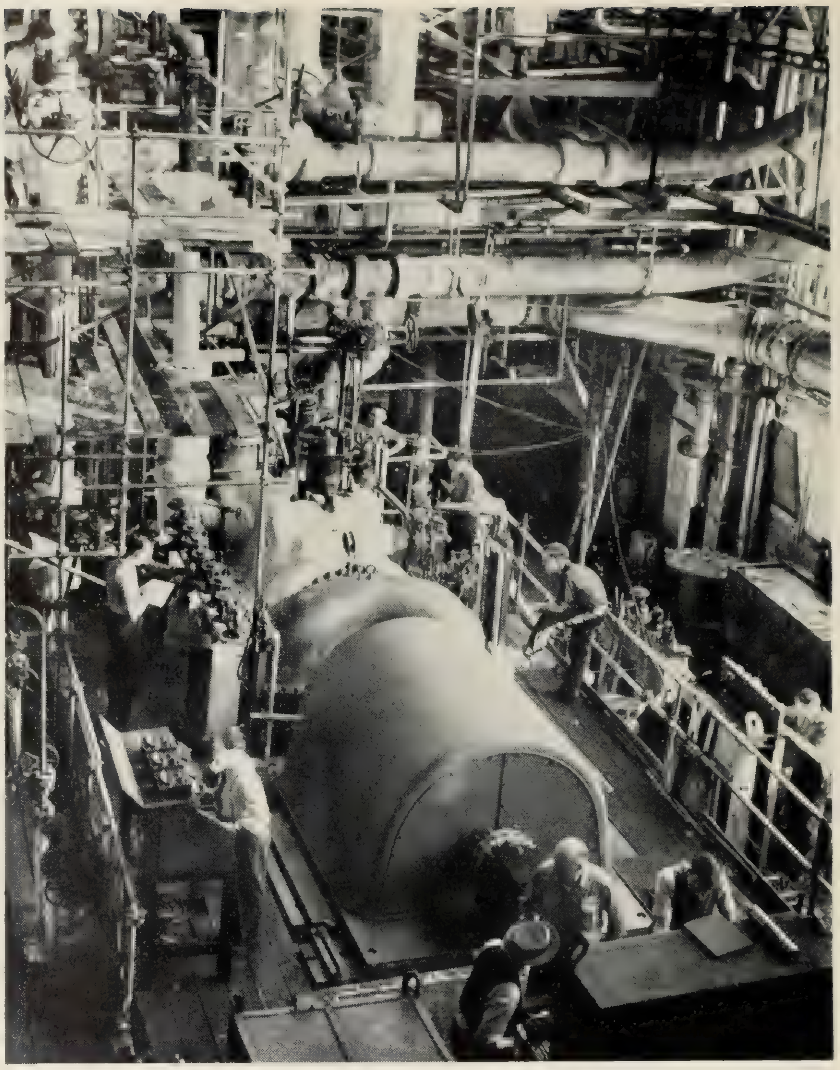
The turbine propulsion equipment for the powerful new battleship South Dakota was completed more than a month ahead of schedule in the shops of the General Electric Company. South Dakota was launched at the yards of the New York Shipbuilding Company on June 7, four months ahead of schedule.

Propulsion equipment for the battleship Massachusetts, soon to be launched, has been completed 10 weeks ahead of schedule.

Like her sister ships Washington and North Carolina, both commissioned recently, and Massachusetts, the propulsion equipment for South Dakota, as well as switchgear and certain auxiliary equipment, was built by General Electric.

In addition to the equipment already produced, according to Charles E. Wilson, president of General Electric, the production of millions of horsepower of steam turbines on order with the company for the United States Navy and Merchant Marine is proceeding "on schedule" or "ahead of schedule" at General Electric plants. All-out production is the slogan at these plants, where are also being produced for the Navy such equipment as generators, motors, switchgear, and huge propulsion gears to match the turbines.

In the overall defense picture, this company is now devoting the resources of its Research Laboratory and more than 60 per cent of its men and machines to the development and production of a wide variety of intricate and highly technical equipment for National Defense.



Testing a turbine in the General Electric testing plant

New Coating Prevents Condensation Drip

Weather and temperature changes can play some queer pranks, but none is more costly than condensation collecting on ceilings and side walls of freight cars, transport trucks, cargo ships, in storage houses, air ducts, water pipes in basements, etc.

Damage from sweating or dripping water on raw materials, food products, furniture and other merchandise that must be shipped from place to place or kept in storage awaiting disposal, runs into high figures every year.

Now, there has been developed in the plant of the J. W. Mortell Company of Kankakee, Illinois, a well known industrial paint manufacturer, established in 1895, a remarkable new product called Insulmat No. 595. It is a spray-on plastic compound, containing specially treated cork particles, which is guaranteed to absolutely eliminate condensation drip.

Insulmat No. 595 is self-bonding, requires no priming coat, adhesive or supports, and can be applied to any metal surface. This coating gives positive protection at lowest cost. There is no upkeep and it is said to last as long as the metal to which it is applied.

At Purdue University, this new product has been subjected to intensive vibration and other severe tests under various conditions and has been found to possess unusual adhesion, to be odorless and to form a valuable protective coating to metals.

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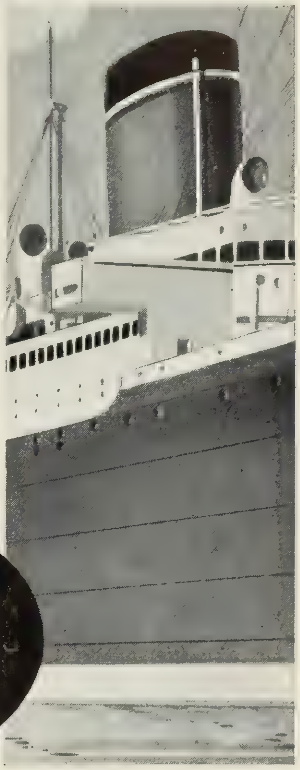
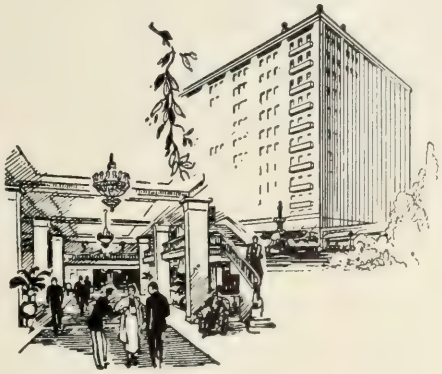


Inexpensive
COMFORT



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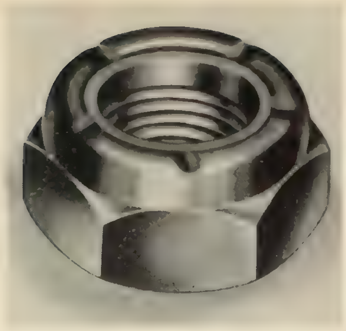


Thin Hex Elastic Stop Nuts

For use on shear bolts where a high degree of the stress is lateral, and for general application to light and medium stress fastenings, an improved line of thin hex nuts is announced by Elastic Stop Nut Corporation.

These nuts have approximately 40 per cent of the strength of standard-height hex nuts and have been developed to meet the demand in virtually every industry for a self-locking fastening which offers savings in space requirements, weight, and cost. An indication of their suitability is the fact that they are approved for use on aircraft by all of the military and civil authorities.

As in the standard height Elastic Stop Nuts, the self-locking action is accomplished by means of a vulcanized fiber collar which is built into the head of the nut. This tough bone-like material resists the entry of the bolt, thus forcing the nut outward and taking up all thread play. The fiber, being non-metallic and of a resilient character, does not deteriorate under vibration, and so continues to hold the threads of nut and bolt in a constant pressure-contact.

The nuts are available in steel, brass, and aluminum, in a complete range of standard sizes, both coarse and fine thread. A folder, sent upon request to the manufacturer, explains in detail the Elastic Stop self-locking principle.

Lightweight Air Hose

A specially designed lightweight air hose for pneumatic riveters, chippers and other tools was announced recently by United States Rubber Company.

The new product, weighing only 20 pounds per 100 feet, cuts in half the load to be carried by workers handling pneumatic tools, thus conserving their strength and energy for more efficient work. Reduction in weight likewise increases flexibility, important for riveting and chipping in many tight quarters on board ship.

The designers claim that strength has not been sacrificed by lightening the new hose. It is made with a $\frac{1}{16}$-inch thick, oil-resisting rubber tube, one ply of specially braided lightweight yarn, and a $\frac{1}{16}$-inch, abrasion-resisting cover. Its burst value is approximately nine times the average operating pressures encountered in this service.

The new product is said to be in line with the recent tendency to lighten tools used in pneumatic work; a heavy hose tends to throw such tools out of balance. U. S. Rubber points out that durability is particularly necessary because of the common practice workers in this industry resort to, that of kinking the hose from four to eight times per day to shut off the air pressure while oiling the tools.

Improved Instrument Charts

An improved design in recording instrument charts made for continuous re-use has been developed by the Permochart Company.

Made of Vinylite plastic, Permocharts can be constantly re-used, as the previous day's ink record is easily removed from its surface with a damp cloth. Designed especially for industries such as petroleum refineries, pipeline companies, natural gasoline and gas producers, food, chemical companies, utilities including water, electric, gas, steam and sewage disposals, hospitals, breweries and distilleries, steel, smelting and metal refining, process and other similar industries where large numbers of recording instrument charts are used, Permocharts are said to reduce chart costs by 80 per cent or more.

The new Permocharts will not curl, are non-flammable, and are oil, gasoline and grease resistant. Because each chart is in use over a long period of time, chart centers are now reinforced to prevent deterioration, even from holding devices using sharp projections. The printing and laminating of Permocharts have been improved so that the charts are now clearer and cannot separate at the edges. Each chart is guaranteed for daily use over a period of two years under normal working conditions.

For applications where it is necessary to save chart records, the Permochart Company has established a microfilm photographic system for recording and filing. According to the manufacturer, this method reduces filing space by 98 per cent of that normally used, and a cost analysis shows that, in plants where 100 charts per day are used, a saving of 23 per cent resulted; if 300 charts per day are used, the saving is 42 per cent.

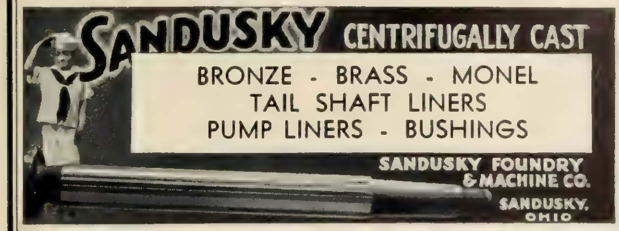
Midget Flexarc Welder

For use in welding light gage metal, castings and drive shafts, general maintenance and light production work, a new Flexarc welder is announced by Westinghouse Electric and Manufacturing Company.

Known as the Midget Marvel WT-1, this ac welder comes complete with all accessories, even to the primary cable for hooking up the power line. Included in the accessories are electrode lead and holder, work lead, helmet, and a supply of electrodes.

Sensitive adjustment of the welding current over a range from 20 to 140 amperes is provided by 15 steps with correctly proportioned increments between steps. Full load rating is 110 amperes, 30 minutes, 30 load volts, when used on 220 volt, 60 cycle lines. The cost of power consumption averages about 5 cents an hour, depending on local power rate.

The unit is very compact. Approximate dimensions are 14½ by 12⅛ by 20 inches long. Weighing only 160 lbs., the welder is supported on casters to facilitate mobility.



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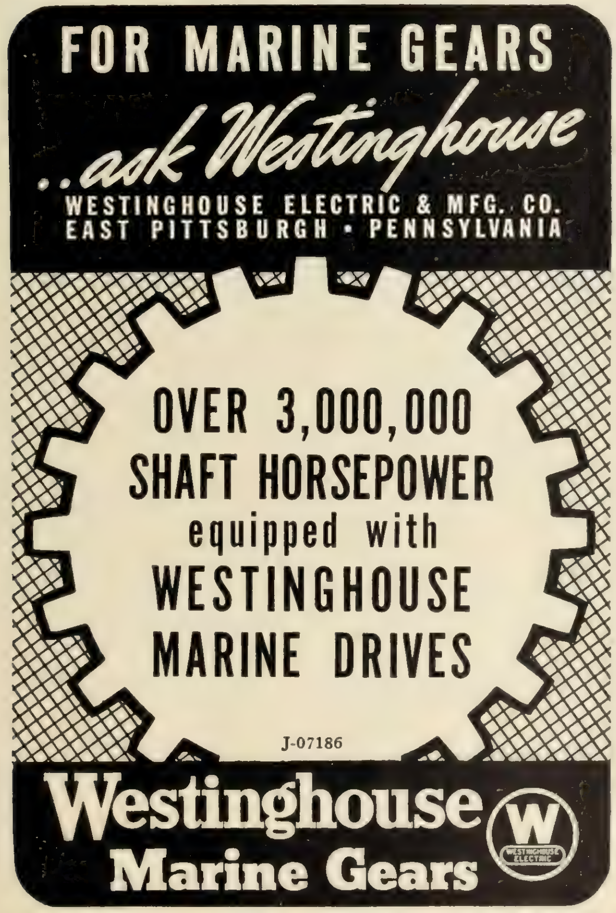

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The Catalogs of Today Become the Technical Handbooks of Tomorrow

Feed Water Chemistry, publication 3006, the Cochrane Corporation, is a 12-page booklet giving the fundamental reactions involved in water softening and calculated to be helpful in the interpretation of water analysis.

The text is a revision of a booklet issued by Cochrane in 1934. Particular attention is given to "Ionic analysis" and to the use of "equivalents per million," which greatly simplifies the necessary calculations.

Every steam engineer should have a copy of this book.

Water Jacket Cleaning. Because periodic removal of scale and rust deposits from diesel cooling systems is essential to avoid engine overheating and other costly troubles, operators of diesel-powered vessels will be interested in a short article on this subject appearing in the May-June issue of *Oakite News Service,* house magazine of Oakite Products, Inc.

The article describes how an improved method designed especially for doing this important maintenance job safely recently enabled one diesel operator to restore normal cooling efficiency of his diesel engine easily and quickly.

Copies of the article are available upon request.

Packings, Form PK-12A, is a completely new 45-page illustrated catalog of packings and gaskets, containing service recommendations and suggestions, just published by Johns-Manville. In addition to detailed information on J-M packing and gasket styles, the handbook includes handy recommendation tables which serve as a guide to proper packing selection for various types of equipment under such diversified service conditions as steam, brine, ammonia, acids, caustics and oils. An analysis of the factors which determine packing performance and helpful hints on getting the most out of packing and gaskets are given.

Marine Turbine-Generators. Turbine-generators, 200 kw and above, for marine service are described in a new four-page folder, F-8571, just published by Westinghouse Electric and Manufacturing Company.

The general discussion includes such features as space conservation, accessibility of parts, and directed air flow. A cutaway photograph shows positions of the principal parts.

The strap type, oil-relay governor, an exclusive feature of this generator, is described and illustrated.

Application data gives kw rating, physical dimensions, weight and other essential facts.

What Users Say About "Caterpillar" Diesel Power, Form 6636, published by Caterpillar Tractor Co.

This 16-page booklet discusses problems solved by application of diesel power and portrays various installations. The text deals with savings effected in a multiplicity of fields—irrigation, mining, cotton ginning, powering sawmills, milling flour, lighting construction jobs, drilling, feed milling, lumber finishing, poultry hatchery, construction equipment, ice and refrigeration, marine engine, heavy-duty hauling, sand, gravel and crushed rock, shovel, creamery, oil pumping, hammer mill, machine shop and locomotive.

Hoists—Electric—Catalog H-40, published by American Engineering Co., describes the construction, operation and application of Lo-Hed monorail electric hoists; 26 pages. It is well illustrated and complete with capacities, speeds, heights of lift and many other specifications. It includes dimension drawings of all types of hoists.

Form 4062B, a revision of the booklet, ***"Opportunities for Profits With Portable Machine Cutting,"*** has just been announced by The Linde Air Products Company, a unit of Union Carbide and Carbon Corporation. This booklet describes the many advantages of oxy-acetylene cutting with portable machines, the diversity of operations which can be performed, and a variety of applications. Several new profitable "hints and kinks" on the use of these machines have been added.

The general operations possible—straight-line cutting, bevel-cutting, shape-cutting, circle-cutting, and heavy cutting—are illustrated in this booklet, and a number of views of cut edges are given to illustrate the results of correct and incorrect cutting techniques. In addition, some typical applications in the aircraft and automotive industries, iron and locomotive works, machine shops, job welding shops, shpyards, and steel mills are listed. The section on suggestions for extending the usefulness of portable machine-cutting has been enlarged; and a new page describing a special setup for templet-tracing has been included.

C-E Spreader Stoker, catalog, No. SS-2, just issued by Combustion Engineering Company, Inc. An attractively printed twelve-page booklet which contains eighteen photographic illustrations of assemblies and typical installations, together with close-up views of the feeder, distributor, drive mechanism, and dump grate details.

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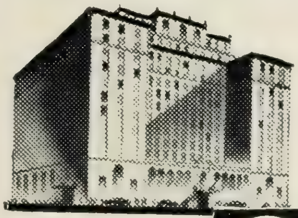

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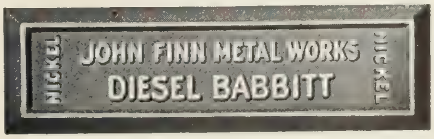

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Guy M. Thompson

It is with profound sorrow that we chronicle the sudden passing of Guy M. Thompson, who has been identified with the marine manufacturing representation business on the Seattle waterfront for many years.

Mr. Thompson was born in Iowa on November 11, 1872. His father was the late F. J. Thompson, a famous steamboat builder.

Young Guy started his steamboat career when he was 15 years old, aboard a Mississippi tug.

Forty years ago the family moved to Puget Sound, and the young man quite instinctively turned to the waterfront as his career. His first Seattle job was in the ship caulking business. Later he joined the Puget Sound Navy Yard at Bremerton. It was in 1911 that he became sales representative for the France Packing Company in the Seattle district. Over subsequent years he added other important lines to his selling representation, including the several products of Xzit Sales Co.

William H. Rudy of Xzit Pacific Company tells us that **W. H. Rober** will carry on the business. Mr. Rober is well known among the engineering fraternity, having been a marine engineer sailing out of Pacific Coast ports. After the first World War period he was port engineer for the U. S. Shipping Board in the North Pacific district.

Retires from Coast Guard

Lieutenant Thomas P. Fowler, of the Marine Engineering Section at Headquarters and an employee of the former Lighthouse Service, is to retire from active duty on August 1, after 36 years of service. He entered the Lighthouse Service in 1905 as first assistant engineer and served as first assistant and chief engineer on various lighthouse tenders located in the Gulf of Mexico, on the Atlantic Coast, and on the Great Lakes until 1913 at which time he was detached from sea service and assigned as superintendent of construction in the Lighthouse Service.

During this assignment, he supervised the construction of twenty-one lighthouse tenders, among them the Tenders Wakerobin, Hickory, Hemlock and Hollyhock, and fourteen lightships including No. 112 (Nantucket), the largest lightship in the Service. Lieutenant Fowler was superintendent of construction in various shipyards on the Atlantic Coast, the Great Lakes, the Western rivers, and the Pacific Coast.

After the consolidation of the Lighthouse Service with the United States Coast Guard in 1939, he was commissioned lieutenant in the Coast Guard and assigned to the Marine Engineering Section at Headquarters.

Lieut. Thos. P. Fowler

John D. Reilly has been reelected for his tenth consecutive term as president of the Todd Shipyards Corporation at the annual meeting of the corporation directors in June.

He was first elected for this office in 1932 to fill the vacancy left by W. H. Todd, the founder of the corporation.

◆

The Cochrane Steam Specialty Company, Boston, announces the addition of **Samuel Reid** to the organization. Mr. Reid will be actively engaged in sales engineering work, handling the well known products of Cochrane Corporation, the Hays Corporation, Northern Equipment Company, Reliance Gauge Column Company, and Vulcan Soot Blowers.

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Pacific MARINE REVIEW

August, 1941

On the Job with America's Defense

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In the construction of each of these great works, both Tubbs and Portland rope have played and are playing an important part, many thousands of pounds being used.

The records established by Tubbs and Portland rope on these jobs parallel the records they have established on the job with other vital links in America's defense. Day in and day out, under every sort of condition, they are proving their stamina and dependability.

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Pacific MARINE REVIEW

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OUR COVER

Superbly balanced photograph taken just as the Alcoa Puritan took the water at Bethlehem's in San Francisco. Other views and details of this C-1 cargo steamer appear on pages 52 and 53 in this issue

Official Organ

Pacific American Steamship Association

•

Shipowners Association of the Pacific Coast

•

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October 21, 22, 23 and 24, 1941

THE Propeller Club of the United States again sponsors the American Merchant Marine Conference, this year in conjunction with its Fifteenth Annual Convention at San Francisco—one of the nation's greatest seaports and center of American shipping on the Pacific Coast.

Subjects of timely interest and importance to the entire American Marine Industry will be presented at the Conference by recognized authorities, the purpose being to provide an open forum for the discussion of problems confronting the industry, to promote the spirit of cooperation, advance the American Merchant Marine in all its branches, develop public interest in American water transportation, and to further our National Defense.

Conference sessions will be held on Thursday, October 23rd and, in the evening, the American Merchant Marine Conference Banquet . . . Propeller Club sessions on Wednesday, October 22nd, and Friday, October 24th . . . Entertainment features—sightseeing trips, golf tournament, plenty of time to visit San Francisco, one of America's most interesting cities.

The need for coordinated and constructive effort was never so necessary as at the present time . . . Your help and participation are needed in this program for furthering the best interests of the American Merchant Marine for our military and economic defense . . . Arrange now to attend the Conference and Convention, and to take part in this most important annual gathering of the American Marine Industry.

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Pacific MARINE REVIEW

AUGUST · 1941

Two Ships a Day!

American Emergency Shipbuilding is forging ahead in high gear and new shipyard construction and the fabrication of ships in the new yards are already better than sixty days ahead of schedule.

Schedule calls for the delivery of ships at the rate of two a day by November 1, 1942, and the continuance of that rate until December 31, 1943.

We may therefore look forward with reasonable expectation to the delivery of two ships a day by August, 1942, or approximately one year from date.

The average rate of delivery in 1940 was between four and five a month. In 1941 this rate will probably be about eight a month.

The average rate in 1935 and prior for some years would be less than two a month.

Considering these figures, the progress made by the shipbuilding industry in response to the National Defense demand is nothing short of amazing. Our Pacific Coast yards are participating in this response with a very heartening display of energy. In the erection and equipment of new yards, we are making remarkable records.

In the fabrication and erection of new ships, Pacific Coast workmanship and speed are again out in front.

We have even begun to underbid the Atlantic Coast yards.

These facts should be very heatening to the Pacific Coast shipbuilders. There will be new shipbuilding work ahead for several years after this war emergency job is finished and the war is over—plenty of commercial shipbuilding work to build up the world's depleted merchant fleets.

Two ships a day in 1942. Seven hundred champagne bottles; seven hundred ships' names; seven hundred sponsors—all in 1942. When you think of all the machines, the gadgets, the items of equipment, the pieces of material, the wires, the pipes and the paint that go into one American ship and multiply those by 700 in 12 months, all you can say is those figures are astronomic.

American

The Maritime Commission

# of Coastwise, Intercoastal

Exporters and Importers Discuss Problems

At San Francisco, July 23, some 60 exporters, importers and operators met at an informal dinner under the auspices of the San Francisco Foreign Trade Association to discuss their present problems.

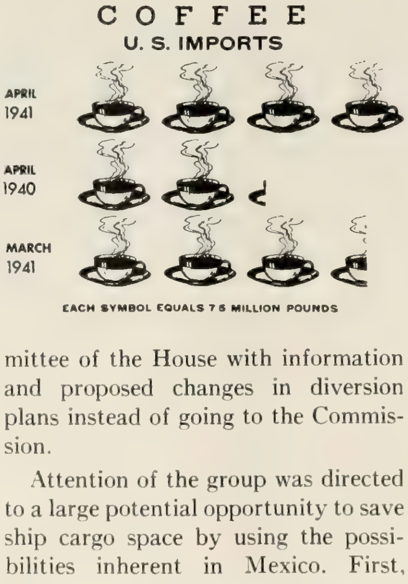
President Wm. F. Minehan presided and Wm. Bush, secretary, led the discussion. The questions proposed for discussion could all be grouped under three general problems, namely:

(1) Problems of Cargo Space

(2) Problems of License and Priorities

(3) Problems of Foreign Exchange.

Under number (1), the general concensus of opinion indicated: that the exporters and importers were having a difficult time finding space for shipments; that the Pacific Coast was harder hit than other sections in diversion of tonnage; that the U. S. Maritime Commission, as an executive branch applying the rules and regulations, had a mighty tough assignment in coordinating American shipping but was doing a very good job under the circumstances; that the steamship operators were cooperating well under coordination; and that the San Francisco Chamber of Commerce was wise in going to the Merchant Marine Committee of the House with information and proposed changes in diversion plans instead of going to the Commission.



Attention of the group was directed to a large potential opportunity to save ship cargo space by using the possibilities inherent in Mexico. First, Mexico has large deposits of most of the defense metals and these deposits are strategically located for rail shipment. Second, the Isthmus of Tehuantepec route would save much steamer time in intercoastal and direct European services, particularly as capital is made available for double- or even triple-tracking the railroad from Salina Cruz to Puerto Mexico.

Under number (2), there were two interesting suggestions made on priorities in exports, particularly to Latin America. First, every exporter should study his commodities with a view to obtaining priority on the plea that these commodities are more or less vital to the defense schemes of those nations to whom they are being sent, and therefore vital to Western Hemisphere defense. Second, the plea for priority should, if possible, be presented through the embassy of the nation to which it is proposed to ship these commodities, thus adding to the defense angle the weight of "good neighbor" policy.

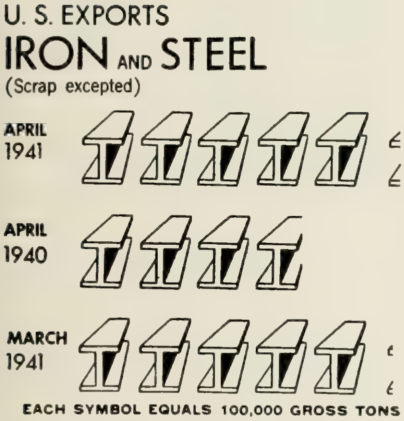
Some concern was expressed over the matter of possible misunderstandings under the regulations banning trade with certain areas, nationals and particular firms. Importers, for instance, may be receiving from a free firm, shipments of commodities assembled in Batavia or Singapore, and containing sacks or cases with many markings, some of which may be those of a banned firm. The letter of regulations would make the American firm responsible, although the practice of the Treasury Department is to assume that the American importer had used "due diligence" to uncover this irregularity and was therefore free from blame.

Number (3) seemed to be responsible for the most headaches, particularly in the matter of "blocked funds." Some of the foreign traders seemed to think the matter practically hopeless. Most of the bankers thought there was always a method of getting around the situation without violating the rules. For instance, Switzerland will not now accept dollar credits against franc credits, so it is necessary to establish a

Shipping Trends

Now in Complete Control and Overseas Shipping

(Trad-o-grams by U. S. Department of Commerce.)



3-cornered deal where the dollar credits are balanced against Argentine pesos and the pesos in turn against Swiss francs.

All present were agreed on three counts:

(1) We will play ball with the Federal Government;

(2) The foreign trader is in for a rather tough time; and

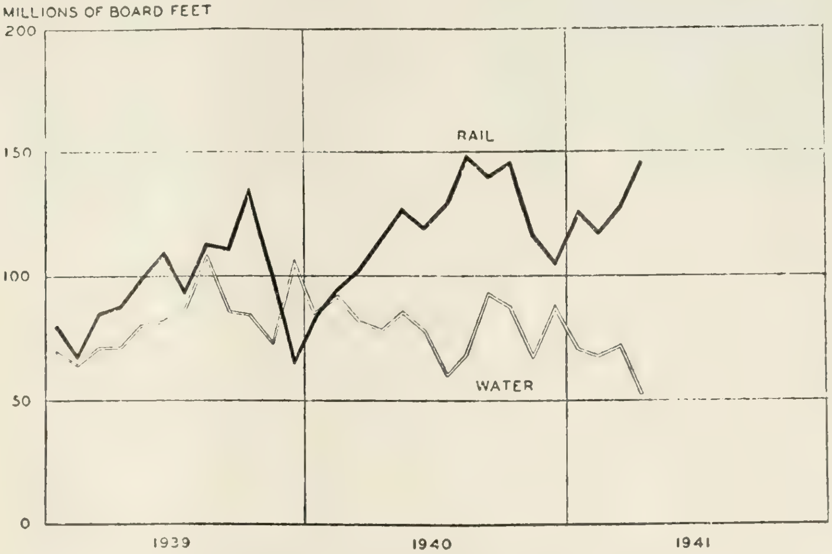
(3) The foreign trader has one sure hope for the future, *i.e.*, "there will be another circular from Washington tomorrow."

Diversion of Intercoastal to Rail

Since the outbreak of war in September, 1939, a large number of vessels serving the intercoastal trade have been diverted to other routes. These diversions have reduced available ship tonnage approximately one-third. In 1940, total intercoastal traffic through the Panama Canal aggregated 7,300,000 tons, a decrease of only 4 per cent from the 1939 total.

That downward tendency has continued, however, through the early months of 1941. More recently, a program has been initiated under which approximately half the remaining available intercoastal and coastal (Pacific) vessels will be transferred to a 2,000,000-ton shipping pool to be available for special defense purposes. This transfer, to be carried out during the ensuing summer months, will divert additional traffic to the railroads. Such diversion, particularly of spot shipments, has been under way since late 1939 owing to a growing scarcity of shipping space and despite relatively higher rates imposed by the railroads. District freight-car loadings have increased moderately in recent months and, while remaining below the seasonal peaks of recent years, were higher in May than in any similar period on record.

The accompanying chart indicates the extent to which rail shipments of Douglas fir lumber from the Pacific



EASTBOUND LUMBER SHIPMENTS FROM DOUGLAS FIR AREA

Monthly totals, January 1939 to April 1941, of rail and water shipments from the Douglas fir area to destinations in the United States, excluding the seven western states. Source of figures: West Coast Lumbermen's Association.

The new home of the American Bureau of Shipping at 47 Beaver Street, New York, gives them a much-needed larger floor area to handle the immense volume of work thrust on them by the defense program

Northwest to eastern consuming centers have displaced intercoastal shipments through the Panama Canal.

Available information indicates that a similar diversion has occurred, in greater or lesser degree, in shipments of most other commodities except bulky products of low unit cost which are unable to compete, after paying rail freight and terminal handling charges, with similar commodities produced in the east.

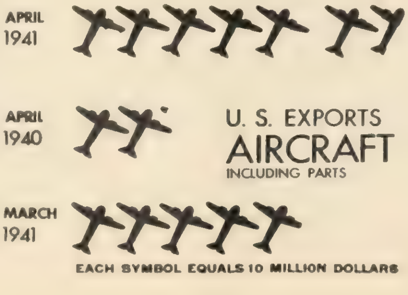
American Export One Year on Lisbon Route

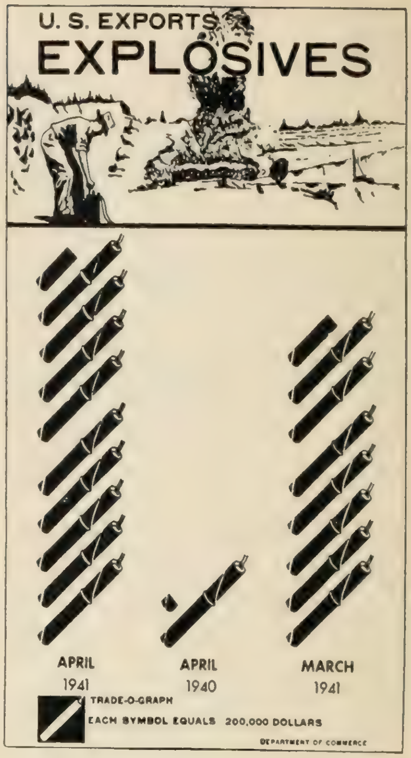
Arrival of the American Export Lines steamship Excambion in New York July 9 marked completion of one year of service on the emergency New York-Lisbon route. The company was compelled to abandon its long-established Mediterranean trade last June when that area was closed to American shipping by Presidential proclamation.

John F. Gehan, vice president of the line, said that his company rerouted its vessels to Lisbon in agreement with the Maritime Commission, and moved its European headquarters staff from Genoa to Lisbon. Service was initiated by the Excambion, which sailed from Pier F, Jersey City, June 28, in command of Capt. W. W. Kuhne.

During this year of operation, the company has completed 51 round-trip voyages, and carried a total of 12,046 passengers, Mr. Gehan said. On 44 of these voyages, the Four Aces, sister ships Excalibur, Excambion, Exeter and Exochorda carried 9512 passengers. The Siboney carried 2534 passengers in seven voyages. This vessel was chartered last fall to replace the Exochorda when that vessel was requisitioned by the Navy as a National Defense auxiliary.

The majority of this traffic was westbound, 10,404 passengers, including thousands of Americans stranded in Europe, having been carried from Lisbon to New York. There were 1642 outbound passengers for Lisbon, and also 895 for Bermuda. The latter group was largely comprised of workers bound for Bermuda to work on defense base projects. The Bermuda traffic developed during the winter months when normal steamship service between the United States and these islands was at a virtual standstill. Passengers were accepted for eastbound voyages only.





Recent requisitioning of the Siboney by the Navy leaves American Export Lines with three vessels to carry on this service. Three sailings each month are scheduled in each direction.

* * *

First Documents In May, 1941

The Department of Marine Inspection and Navigation in its June "Bulletin" reports granting first documentation to 323 American vessels during the month of May.

Of this total, eight were seagoing merchant ships, as follows:

Cape Neddick	6,789	gross tons
Hawaiian Merchant .	7,109	" "
Hawaiian Planter . .	7,798	" "
Hawaiian Shipper . .	7,775	" "
Solon Truman	6,762	" "
Thompson Lykes . .	6,762	" "
Esso Williamsburg	11,237	" "
F. W. Lloyd	515	" "
Total 8 ships . .	54,747	gross tons

Of the balance: 202 were freight barges for inland water transportation with a combined capacity of approximately 100,000 gross tons; 45 were fish boats; 21 were small passenger carriers; 15 were towboats; 9 were small freighters; 9 were yachts; and 2 were ferries.

A Notable Shipyard Expansion

Todd's 25th Anniversary

With more than a century of tradition for efficiency and craftsmanship behind it, Todd Shipyards Corporation, as now constituted, on June 16 celebrated its twenty-fifth anniversary. The skill and capability which had made the original member companies of the organization famous in the field of ship repair and ship construction has been so carried on during the past quarter of a century that Todd and service are taken as synonymous by shipping men the world over.

The story of the advancement and achievement of Todd Shipyards Corporation during the past twenty-five years is one that has been written in the energy and ability of about one hundred men who had faith in themselves and the man who guided and led them, the late William H. Todd, founder and first president of the corporation, and John D. Reilly, present head of the concern.

It was Mr. Todd who, through his keen judgment and foresight, developed Todd Shipyards Corporation until it became world famous for its excellent and dependable workmanship. Under the progressive leadership of Mr. Reilly, the corporation today ranks as one of the largest ship repair and ship construction firms in the world.

In the autumn of 1915, the Clyde family, who then controlled the stock of the Robins Dry Dock and Repair Company, Brooklyn subsidiary of the corporation, desired to sell out their interest in the repair plant. Appreciating the work which Mr. Todd, then president of Robins, had done during the preceding years, they offered him the opportunity to purchase the stock. As a result of this offer, the William H. Todd Corporation was organized for the purpose of taking title to all the stock of the Robins company. This corporation included approximately one hundred men who had been working with Mr. Todd, and the Clydes arranged that they would be given six years to pay off the purchase price with the understanding that a further extension of time could be obtained if necessary.

The fact that the entire purchase price was paid off in somewhat less than one-ninth the time originally allotted is evidence of the remarkable ability and energy of these men.

In June, 1916, with the fulfillment of the obligations of the William H. Todd Corporation an accomplished fact, Mr. Todd visualized the value and need of expanding the activities of his organization and, in order to acquire the plants and business of the Tietjen and Lang Dry Dock Company of Hoboken, New Jersey, and of the Seattle Construction & Dry Dock Company of Seattle, Washington, he incorporated the Todd Shipyards Corporation which acquired from the William H. Todd Corporation all the stock of the Robins Company and independently acquired all the stock of the two other companies mentioned.

Since its inception the success of Todd Shipyards Corporation has been phenomenal and today, under the brilliant guidance and leadership of Mr. Reilly, it is playing a prominent part in the development and expansion of the American Merchant Marine.

Todd companies have contracts to date for the construction of 306 vessels, including 25 destroyers and 5 tankers for the United States Navy; 214 cargo vessels for the Maritime Commission; and 60 freighters for Great Britain. Work on several of the British ships already is under way and all are expected to be completed by December, 1942.

Subsidiaries and affiliates of Todd Shipyards Corporation include:

Robins Dry Dock and Repair Company, Brooklyn, N. Y.; Tietjen and Lang Dry Dock Company, Hoboken, N. J.; Todd Combustion Equipment, Inc., New York, N. Y.; Todd Mobile Dry Docks, Inc., Mobile, Ala.; Todd Seattle Dry Docks, Inc., Seattle, Wash.; Todd Galveston Dry Docks, Inc., Galveston, Texas; Todd-Johnson Dry Docks, Inc., New Orleans, La.; Todd Oil Burners, Ltd., London, England; Seattle-Tacoma Shipbuilding Corporation, Seattle and Tacoma, Wash.; Todd-Bath Iron Shipbuilding Corporation, South Portland, Me.; Todd-California Shipbuilding Corporation, Richmond, Calif.; Houston Shipbuilding Corporation, Houston, Texas; California Shipbuilding Corporation, Los Angeles, Calif.; Oregon Shipbuilding Corporation, Portland, Oregon; Richmond Shipbuilding Corporation, Richmond, Calif.; South Portland Shipbuilding Corporation, South Portland, Me.

United Air Lines Celebrates 15th Birthday

On September 15, 1941, United Air Lines will celebrate the fifteenth anniversary of its scheduled air transportation on the Pacific Coast. This operation was started through a predecessor company, Pacific Air Transport.

To the assured air traveler of today, traveling at 200 miles an hour in a multi-motored transport with all the navigational aids of modern science—and with a stewardess at his elbow to answer his slightest wish—it is difficult to conceive of the progress that has been made in that quick-moving decade and a half.

In the summer of 1926, the Government asked for bids for air mail contract between Los Angeles, San Francisco and the Pacific Northwest. Although the U. S. itself was flying the mail between San Francisco and New York, there had, prior to this time, been no regular operation on the Pacific Coast.

Verne Gorst, operator of an Oregon stage line, was successful bidder for the contract, and with S. V. Hall, now vice president of western operations for United Air Lines, and a number of war-time pilots, inaugurated Pacific Air Transport over U. S. Air Mail Route Number 11.

Gorst planned to use old Army equipment and optimistically estimated that he could set up operations for $65,000. But the ancient Jennies had made too many flights to start afresh on the difficult business of carrying the mail and at the last moment, Gorst obtained six Ryan high wing monoplanes and one Swallow. Open cockpit jobs, powered by single 200-horsepower Wright motors, the carriers had a speed of approximately 90 miles per hour. Later he added a "Travelaire" and two DHs and for a short while in 1927, old Fokkers were used.

The first northbound flight of United's predecessor company, PAT, was from Los Angeles to Seattle and was made without mishap. The southbound flight was from Vancouver, Washington, the mail having been "trained" from Seattle due to a mechanical accident.

Pilot R. B. "Pat" Patterson left Vancouver at 5:52 a.m., carrying four sacks of mail from Seattle and five from Portland. At Medford he was delayed by ceremonies and instead of leaving on schedule at 8:15, left at 8:45. In spite of strong headwinds, he made up 15 minutes of the time on the way to San Francisco.

Pilot Vance Breese was at Crissy Field waiting to continue the flight to Los Angeles. A delegation headed by William F. Burke, assistant Postmaster, was present, as were Gorst and Milo F. Kent of the Municipal Airport Committee.

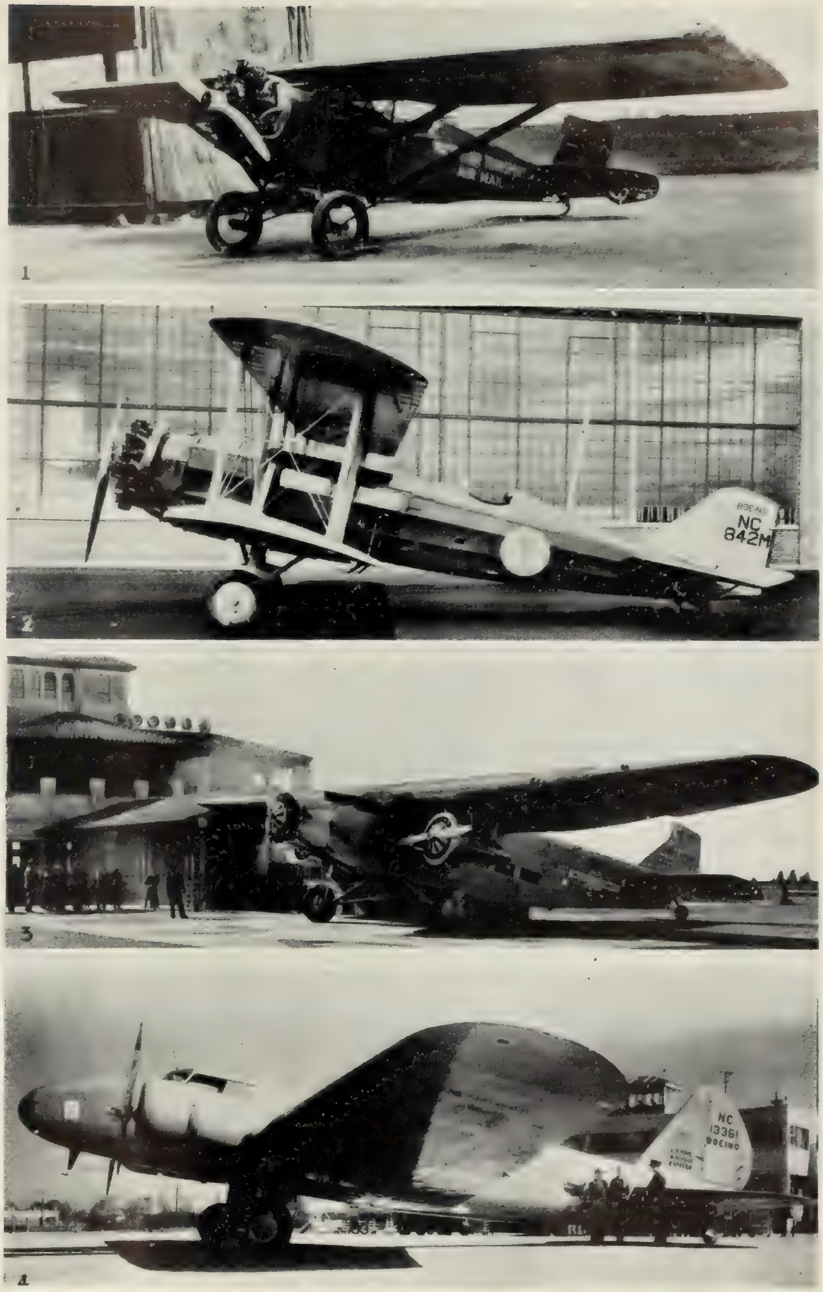
Taking off at 12:30, Breese arrived at Fresno at 2:25 p.m. and finished the flight at Los Angeles at 4:45. The time for the southbound flight was 13 hours, and the distance covered 1099 miles.

The northbound plane, piloted on the first lap by George Allen, left Los Angeles at 12:03 midnight, arriving at Bakersfield at 1:45, where a crowd of more than 5000 persons were on hand to greet the pilot with loud cheers and aerial fireworks. Ten Bakersfield pilots lighted the sky with fire and smoke-writing until the mailplane, lighted with red and green lights, was sighted. Allen reached Concord, Contra Costa County, at 5:30 a.m. on scheduled time. Concord was used for night landings instead of Crissy Field at San Francisco because of better lighting facilities.

Arthur Starbuck picked up the relay there, arrived at Medford at 8:40 a.m. and at Seattle at 11:47 a.m.

Air mail cost was ten cents an ounce or fraction thereof for 1000 miles, and fifteen cents an ounce over that distance.

"Mail was dumped into the cockpits until the pilots hardly had room to move," recalled Hall. "Extra bags were strapped to the wings with the fervent hope that none would fall off."



1. This single-engined Ryan inaugurated the service on September 15, 1926, carrying a pilot and two passengers at a cruising speed of 90 miles an hour. 2. In 1928, this Boeing 40-B-4 increased the capacity to four passengers and the speed to 105 miles an hour. 3. Ford tri-motor, inaugurated into service in 1931, carried 12 passengers and a cargo of mail and express at a cruising speed of 115 miles per hour. 4. In 1933 air transport schedules were revolutionized by this Boeing 247, a twin-engined, 3-mile-a-minute, ten-passenger transport

Subsequent schedules could hardly be said to have been run on stop-watch regularity and mishaps were frequent. That these misadventures often assumed an amusing rather than a tragic aspect can only be attributed to the daring, skill and fortitude of the early PAT pilots.

The roster of names among these pioneers of the airway include in addition to those mentioned above, Dick Bowman, Grover Tyler, Verne Bookwalter, Ralph Virden, J. R. Cunningham, Al Gilhousen, Herbert Miller, H. G. Donaldson, E. L. Remelin, Ray Small and Hershall Laughlin. Bowman, Tyler, Remelin and Laughlin are still flying for United. Russ Cunningham is Director of Communications, and Donaldson is a dispatcher in the Oakland headquarters of United's Pacific Coast division.

Passengers, as well as air express and mail, were carried from the beginning of PAT. However, the mail subsidy, which allowed for $2.50 per pound of mail, was the main interest of all connected with the West Coast airline. Passengers were dumped in among the mail sacks and left to their own devices. Good-natured pilots shared their lunches with this "supercargo," but, all in all, it came under the head of adventure rather than enjoyable air travel.

The cockpits were needed for mail, so neither passenger nor pilot was allowed the luxury of a parachute.

Daring, initiative, skill, optimism and all the hardy qualities needed for pioneering were present among the pilots and organizers of PAT, but there was one thing that was woefully lacking—and lacking in a superabundance. That was *money*.

"We didn't leave any stone unturned in our effort to sell stock in our venture," said Hall. "We visited lumbermen and cooks, bank presidents and longshoremen, train executives and bus mechanics. I think if there had been WPA workers in those days we would have approached them too.

"We were in desperate straits to keep things moving. If anyone would put up as much as $5000 or $6000, we would be so gratified we would make him an honorary vice president, with whatever prestige went with that title.

"Grover Tyler was our general manager at the time. Ken Humphries, now in the sand and gravel business in Oakland, had sold his store for $10,000, which we had our eyes on. We persuaded him to take a scheduled flight with Ralph Virden, and he was so impressed that he placed most of the $10,000 in our stock. We made him general manager, and Grover Tyler went to flying on the line.

"It's amusing, too, how we got Ralph Virden in the first place. Ralph had a DH, which we wanted badly. When we began to run short of planes, we hired Ralph and his DH together on a temporary basis. Of course, we didn't have any money to pay him with, so there was only one thing to do. We made him a regular pilot on the line.

"We were so short of money," Hall

(Page 91, please)

Left to right: C. C. Hutchins of the Elliott Co.; John Massenburg of the U. S. Maritime Commission; F. S. Calmus of the Elliott Co.; and H. John Richardson

Trial Trip of the

On July 21 and 22, the third C-1 cargo motorship from the San Francisco yard of Western Pipe & Steel Company was put through her paces in the Bay and out on the broad Pacific. John Massenburg and his corps of experts from the Maritime Commission tested the engines, the auxiliary machinery, the generators, the motors, and all the instruments. They ran her around in short circles, then straightened out her course for a full speed run. They weighed her fuel and lube oil, and measured her developed horsepower to several decimal places. Then they ordered her reversed from full speed ahead. When they had done their "darndest," they suddently smiled and told the young gal that she was OK, and everybody went home happy.

American Builder was preceded by

Captain Lono, skipper for Western Pipe and Steel, on the trial trip

Henry Hook, chief electrician, and Thomas E. McMullen, superintendent of shipyard, Western Pipe and Steel Co.

Officers who will take over for U. S. Lines talk it over with Maritime Commission. Left to right: Byron Gowley, chief engineer; J. W. Smith, engineer for Maritime Commission; Captain M. Lecknes, who will take command; and A. Horka, first officer

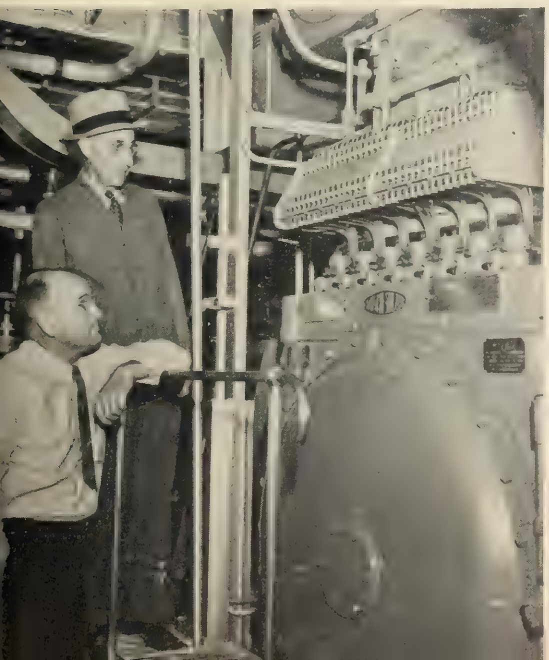
American Builder

American Manufacturer and American Leader, and soon will be followed by American Press and American Packer. All of these vessels are allocated to the United States Lines.

They are completely welded steel hulls and superstructure. Of the standard C-1-B type Maritime Commission design, they are equipped to carry eight passengers in cabins with bath. A complete detailed and profusely illustrated article describing the American Manufacturer appeared in the May issue of PACIFIC MARINE REVIEW.

These vessels are all practically identical and there would be no point in repeating the description. This article is merely a pictorial display of personalities on the trial. Photos are by P. M. R. staff photographer.

W. E. Norin, U. S. M. C., and Thos. E. McMullen, discuss cylinder lubrication



Trial Chief Engineer Bob Ramsey, Bill Williamson, first assistant, and Byron Gowley, discuss controls

J. W. Smith, U. S. M. C.; B. Frankel, and A. S. Whitehead, boiler inspectors, discuss boiler room layouts

E. D. Russel, who will be chief on next trial, pumps J. J. Carter of Foster Wheeler

J. P. Paine, electric inspector, and W. E. Norin, machinery inspector, both of U. S. M. C., figure some results

James Ortrodob and R. F. George, Western Pipe and Steel, taking readings at main control board

F. J. Swaney explains Micromax recording instrument to L. F. Wood, Western Pipe and Steel

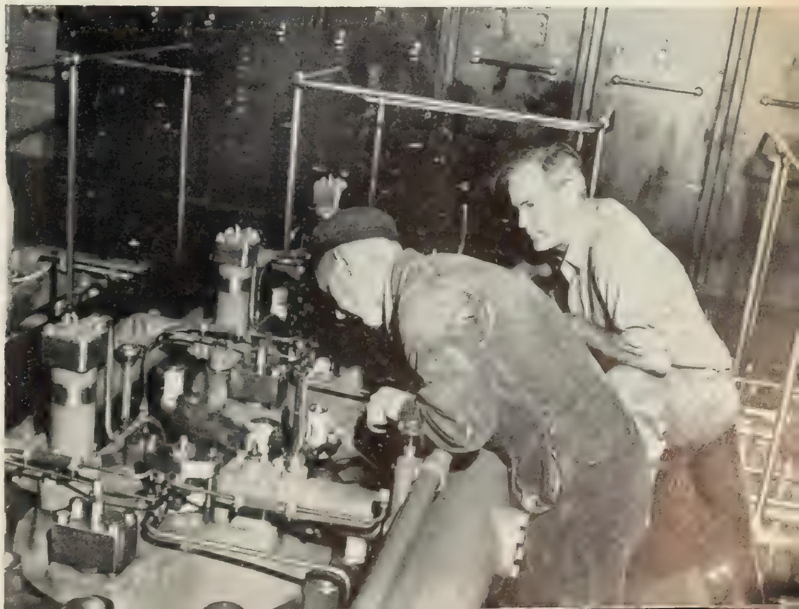
John Massenburg tells one to B. A. Wilson, assistant superintending engineer, U. S. Lines

TWO COUPLINGS TO A DIESEL

Left to right: C. C. Hutchins and F. A. Calmus of the Elliott Co., with Gus Sample of Busch-Sulzer Diesel Engine Co.

J. P. Paine, U. S. M. C. electrical inspector, checks with J. J. Murray, in charge of switchboard for Western Pipe and Steel Co.

Olaf Olson, Western Pipe and Steel, has just adjusted another card on the indicator drum over one of the cylinders on one of the Busch-Sulzer propulsion engines



Expansion and Modernization at Enterprise Engine and

San Francisco Engine Builder Installs to Speed Up National Defense

A U. S. anti-submarine net tender on her trials. These handy steel hulls are propelled by two Enterprise diesel engines driving electric generators connected to electric propulsion motors

Foundry Co.

Modern Lighting Production

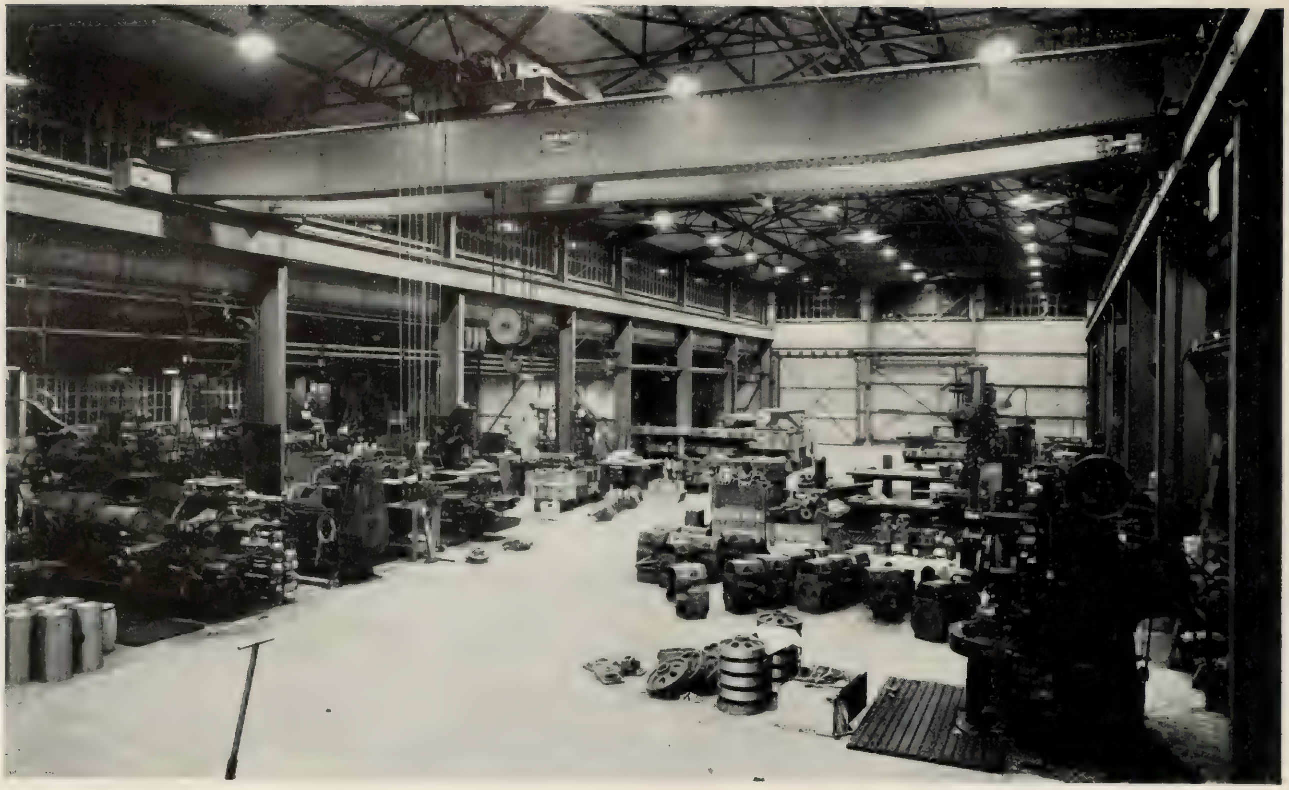
Indirect fluorescent lighting in the chief engineer's office

Working full speed on National Defense and commercial orders, the Enterprise Engine and Foundry Co. of San Francisco has greatly expanded its manufacturing plant and its engineering and sales offices. Today, this firm has one of the largest and most modern diesel engine building plants on the Pacific Coast.

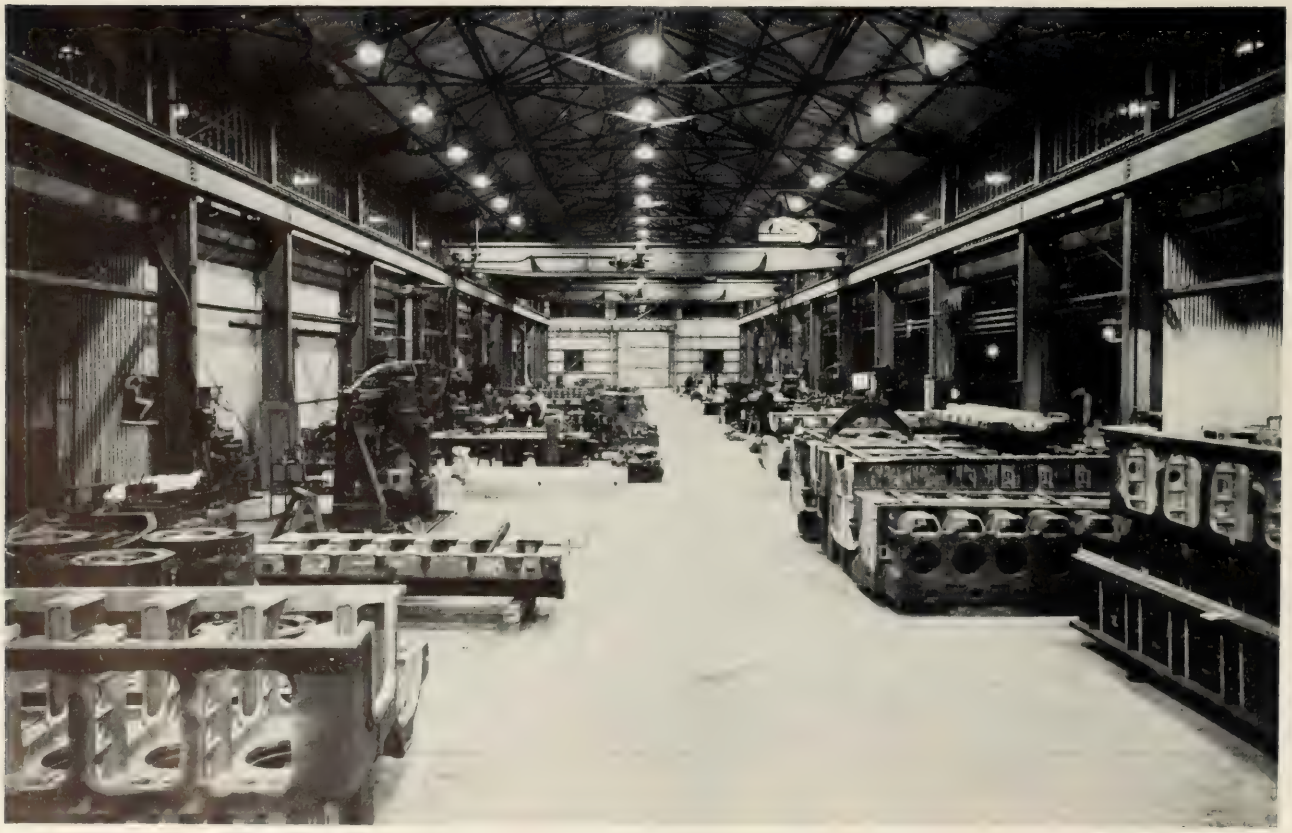
Here the building of efficient economical diesels for naval and commercial vessels, and for power plants is being pushed under a day and night schedule that requires effective nonglare, shadowless lighting for the large shop areas as well as for the drafting room and the engineering office.

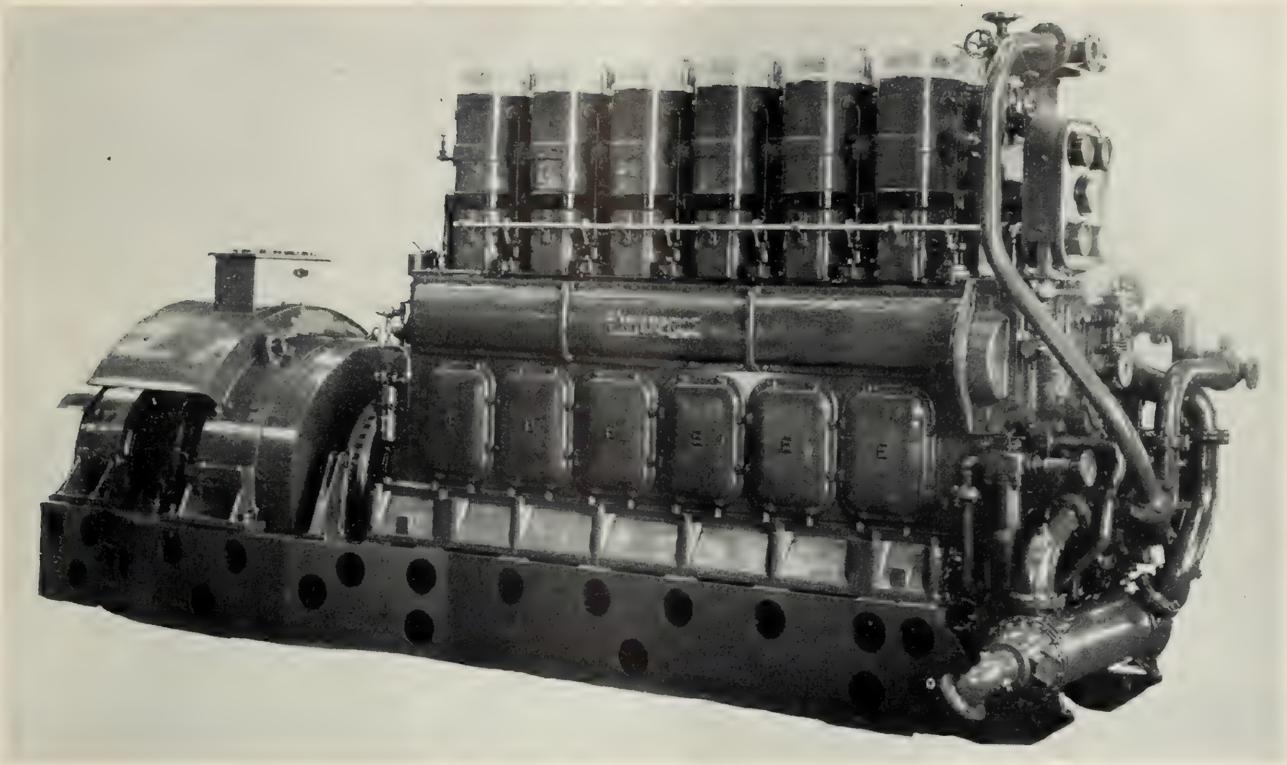
To meet this requirement, Westinghouse lighting engineers provided: for the manufacturing area a system of high intensity mercury-vapor lamps, with the latest type high bay and low bay reflectors; and an indirect system of fluorescent lighting for the drafting room and for the engineering and sales offices. This fluorescent lighting system is said to be the first totally indirect fluorescent system of its size on the Pacific Coast.

The drafting room derives shadowless, glareless, uniformly distributed indirect lighting from inverted fluorescent lamp fixtures



The machinery and assembly areas at the Enterprise Engine and Foundry Co. are adequately lighted by high intensity mercury vapor lamps in Alzack reflectors





Enterprise diesel generating set of the type used as propulsion power for the U. S. Navy anti-submarine net tenders

Fifty-four 400-watt high intensity mercury vapor lamps in Westinghouse high bay Alzak aluminum reflectors with Locklite sockets, are mounted 25 feet above the floor in the main manufacturing aisle. These provide a level of 25 footcandles of illumination on the work. Hinged, dust-tight, clear glass covers prevent dust gathering on reflecting surfaces. The lighting units are mounted in three parallel rows, on 15- by 16-foot centers. The area measures 50 by 260 feet.

Adjoining areas in which machining is done, are illuminated by 250-watt high intensity mercury vapor lamps in Westinghouse low bay dome reflectors mounted 10 feet above the floor, on 12½- by 14-foot centers. These provide an average of 25 footcandles on the work. Reflectors are equipped with dust-tight covers, acid-etched on the inside. Four rows of nine units each illuminate the machine shop, which measures 50 by 130 feet. Seven similar low bay units are used in an adjoining water test room.

Stroboscopic effect or "flicker" is minimized by the use of three-phase, four-wire, 120-volt lighting circuits which are phased so that adjoining lamps are operated on different phases. Lighting circuits are controlled by Westinghouse multi-breaker panels.

Fluorescent lighting eliminated the necessity for rewiring in space leased in an adjoining building and remodeled to serve as a large drafting room, engineering offices, and a sales office. In these areas, a total of 132 inverted Westinghouse type 2-FPC-40 open-end industrial fluorescent fixtures provide an average of 31 footcandles of glareless, evenly distributed light. Each fixture houses two 40-watt, 3500-degree white Mazda fluorescent lamps.

Eighty-four units light the drafting room, which measures 40 by 70 feet. Six parallel rows of four units each are mounted in each of three bays, and six rows of two units each in a shorter bay. Inverted fixtures are supported on 2-by-4 timbers suspended from the ceiling by ⅜-inch iron rods. Mounting height is 9 feet. Walls, ceilings, and undersides of the fixtures have been painted a flat white. All windows are heavily frosted to block out daylight.

General engineering offices, sales office and chief engineer's office are lighted with similarly inverted units. Direct down-light is provided in a blueprinting room by two similar fixtures, not inverted.

A New Recording Torquemeter

McNab of Bridgeport, Inc. announces an electric recording instrument to be used in conjunction with the U. S. Navy standard McNab-Siemens (Ford Type) torsion meter.

This instrument gives a continuous record of the torque developed in the ship's propeller shaft and so provides the basis for a very simple calculation of shaft horsepower developed in the ship's propulsion machinery.

From this accurate determination of horsepower developed, the fuel economy of the ship's power plant can be easily figured.

A preview for the display of this instrument was held at the McNab offices during the week of July 20-26, prior to the first shipment going to the Maritime Commission. The sturdy foolproof construction, clever design and evident accuracy of the new torque recorder brought many favorable comments from the marine engineers and inspectors who took advantage of this opportunity to "Keep Posted" on a new development.

Beach Combers Loot

A number of readers sent in answers to the question that appeared here in the July issue, and is the editor's face red!

The difference between the bird and the reader appears to have some connection with chestnuts.

The answers run thus:

The stuffer of the bird uses more discrimination in picking his chestnuts.

Taken in moderation, the bird stuffed with chestnuts produces a comfortable sense of well-being.

The bird is not stuffed with chestnuts until after his death.

An Eight-Day Voyage Without Skipper or Crew

In January 11, 1883, some fishermen were working on the beach at the Island of Lepsoe, on the Norwegian coast, 12 miles north of Aalesund. One of them, looking up from his work, exclaimed, "Boat coming in!" All the men began to speculate about this new thing. No boat was due. They knew of no Norwegian boat with that type of rig. She had her jib and staysail set, but no mainsail.

The boat came nearer, and suddenly one of the men said "There is no one on deck—no one at the wheel—see how she yaws and loses the wind." Then they noticed that the sails were badly torn and some of the rigging rather slack. They knew the entrance to this cove was difficult, even with a good pilot. The surf was running high and it seemed inevitable that this strange boat would be broken to pieces on the rocky reefs offshore.

As they watched in wondering fascination, she yawed and veered and then as if guided by an unseen hand, found the entrance and neatly beached herself upright on the exact spot in the sand that would have been chosen by the most expert of pilots.

The fishermen walked to her bowsprit and were able to clamber aboard almost dry shod. On deck, they found all the gear in order but giving evidence of a severe battering by the sea. No person in sight.

They spelled out her name—"Columbine"— and that of her port, "Lerwick." She was a sloop—apparently a small coaster—fitted to carry freight and a few passengers. The fishermen could not read English so the log and the manifest meant nothing to them. They explored further, looking for signs of life (or death).

Going below, they heard a low moaning coming from one of the cabin berths, and there they found an old lady in the last stages of exhaustion and hunger.

Here was a human being in distress, and the fishermen knew not what to do. They carried her ashore and turned her over to the women folk, who fed her and put her to bed. The men, meanwhile, secured the Columbine and cleaned up her decks and rigging.

F. Pierce Sherry of Mill Valley did not wander far from the beach to find this excellent photographic study of some beachcomber's loot

Next day with the lady aboard, they sailed the coaster 12 miles south to Aalesund and registering a claim for salvage, turned the ship and lady over to the British consul there.

Inquiry by the consul brought out from the lady the following:

Her name was Elizabeth Monat, a spinster, residing in Greetness, Shetland Islands. She had engaged passage on the coaster Columbine, to leave on the morning of January 3, to go to Lerwick for medical attention. This was ordinarily a three-hour voyage and Miss Monat had taken along a few biscuits and a bottle of milk for lunch.

She declared that the vessel had started in good order with a crew, consisting of the captain, a mate and one sailor. Being not very well, she had lain down on a berth in the cabin and almost immediately fallen asleep. When she awoke, the little ship was tossing about and she crawled up the companionway till she could look around on deck. She could see nothing but very rough ocean all around and no one on deck. She called as loudly as she could but got no answer. She noticed the wheel was lashed and no helmsman. She reasoned that the crew must be forward having trouble with the gear, and she crawled back to her berth. After a night of restless sleep, she tried again to attract the attention of someone on deck and finally realized that she was alone, as far as human companionship or help was concerned. Being a good Scotch woman, she entrusted herself and the ship she was on to the guidance of the Great Pilot and made herself as comfortable as possible. Slowly she counted the hours and days until, practically in a coma, she was guided into the quiet Norwegian haven to find rest and revival.

The consul, of course, continued to inquire, and through Lloyds and other sources soon found the following: Columbine had cleared the landing at Greetness regularly on January 3, with one passenger, a lady, and the usual crew. The wind was strong from SSE with occasional snow squalls; the coaster was running under double reefed mainsail, with wind on starboard quarter. A sudden squall carried away the main sheet and the swing of the boom knocked the skipper and the mate overboard. The mate was pulled aboard by the sailor. These two lashed the main boom, secured the wheel, hauled the staysail to windward and put out in the small boat to rescue the skipper, who was struggling in the sea. They rowed to the spot where they had seen him, but he had gone down and was never seen again. As they turned sadly away to row back to their ship, they discovered that the wind had veered and the Columbine was making away "full and by" at a good speed. After a short struggle, they realized that a stern chase was hopeless and so made for the nearest landing some three miles off. There they notified Lerwick.

From that port, a collier put out almost immediately to search for the Columbine. The steamer Earl of Iceland followed as soon as she could raise steam. After 24 hours stormy search, the steamer returned, reporting no trace of the Columbine, and she was given up as lost.

Naturally, the story of this remarkable crewless voyage over one of the worst of winter seas and in a great storm stirred up tremendous interest in the shipping circles of North Europe. Miss Monat became immediately a popular heroine. Gifts of money and many presents were showered upon her, and it is pleasant to record that she was able to live in comparative luxury in her native village for another 30 years with, let us hope, a minimum of "medical attention."

A tall ship going to the Breaker's

Westinghouse Chief Inspects Pacific Coast

On July 16, A. W. Robertson, chairman of the board, Westinghouse Electric and Manufacturing Company, visited San Francisco during a tour covering Pacific Coast interests of his firm.

This robust, vital, enthusiastic executive took hold of the Westinghouse corporate management in 1929, reorganized it along divisional lines, guided it through the depression years and is now steering a level-headed course through this equally difficult defense boom period.

Space forbids even brief mention of all the defense and commercial activities of his great organization. The following comment gives a few of the highlights as developed by Mr. Robertson in an interview.

Enough aluminum to build 130 two-engine Army bombing planes has been released by use of plastics, steel, and other materials in the Westinghouse Merchandising plant at Mansfield, Ohio.

More than one and one-half million pounds of aluminum has been withdrawn from 1941 requirements for electric refrigerators, ranges, and other appliances, Mr. Robertson reported. Other vital defense materials conserved by use of alternate materials at the Mansfield plant include more than 150,000 pounds of nickel and approximately 100,000 pounds of zinc.

"Our engineers have been working day and night on this matter of materials," said Mr. Robertson. "In the first place, they are devoting their efforts to conserve every ounce of metal essential to defense. Then too, they are working to conquer the problems presented by these shortages of materials, and to develop alternate materials and parts which will perform as efficiently as those made of the vital defense metals.

"To our surprise, we found that many of our substitutes proved to be better than the originals. While we have been looking for one thing, we often have found an improved material or device that we weren't even trying to find. Under the drive of necessity, we have been stimulated to better and more efficient work, and are turning out products even better than before, from the standpoint of durability as well as performance."

Mr. Robertson paid high tribute to the engineering and manufacturing departments for their determination and enterprise in the face of restriction of materials. "Naturally, we subscribe wholeheartedly to the fact that defense has and must have first call," he said. "That is our primary purpose in all this work. The future of America is involved, and we want first to protect that.

"Beyond that, we believe it is our duty to continue to promote electrical living. The day is coming when peace must take precedence, when a vast supply of kilowatts must be used by appliances instead of war industries, when we will have thousands of workmen in our plants and in our suppliers' plants who must be kept busy; moreover, our distributors and dealers must continue to work and to live by their efforts in the appliance field."

An example of material replacement cited was the use of a molded plastic instead of aluminum for a major electric washer part—the turbulator which agitates the clothes in the washing process. A major saving of material was accomplished, since 1,800,000 turbulators were used in 1940. However, even a tiny part such as a refrigerator shelf slide, by a change-over to another material, conserves 12,000 pounds of aluminum.

Many new uses have been found for porcelain enamel ware, and the Mansfield plant has started a $240,000 addition to its vitreous enamel facilities. Replacement parts generally cost more than the parts formerly used, he said, due to changes in production methods, higher prices and other factors.

Westinghouse is now engaged in building more than $200,000,000 of equipment for the National Defense Program. In addition it is also building considerable equipment for normal peace time requirements.

More than 69,000 people are employed by the company, compared with 51,000 a year ago. Mr. Robertson estimated that the employed personnel will reach 80,000 by the middle of 1942.

To meet the increased production demands for both defense and peace time equipment, the company now has under way several expansion projects including installation of additional machinery and tools at the Westinghouse Steam Division, Lester, Pa.; a new fluorescent lamp plant at Fairmont, W. Va.; new manufacturing and warehouse buildings at the Westinghouse Lighting Division, Cleveland, Ohio, and additional manufacturing facilities at the Westinghouse East Pittsburgh works.

In addition to its own expansion program, the company is building two ordnance plants for the Navy at Louisville, Ky., and Canton, Ohio. Westinghouse will also operate these plants for the Navy.

Besides supplying radio equipment for the country's defense forces, Westinghouse is building steam turbine propulsion equipment and auxiliary apparatus for ships, including more than 100 fighting craft; motors and generators for Navy vessels; transformers for shipyards and other industries manufacturing defense materials; turbine generators for power plants; ordnance equipment for the Navy and the Army; ignitron rectifiers for such vital defense processes as the manufacture of aluminum; airport lighting equipment, and many other types of apparatus needed in the defense program.

The Westinghouse Steam Division is at work 24 hours a day turning out more propulsion equipment for ships than any other American factory. This propulsion equipment alone, if made to turn electric generators, could furnish enough power to light more than ten million homes.

In addition, the Steam Division is building land turbines for power plant and industrial use which have a total capacity of 2,400,000 horsepower. The Steam Division's backlog of orders is more than $130,000,000.

Other Westinghouse plants participating in defense production include the Westinghouse Lighting Division, Cleveland, Ohio; Westinghouse Lamp Division, Bloomfield, N. J.; Westinghouse Meter Division, Newark, N. J.; Westinghouse Motor Division at East Springfield, Mass., and Lima, Ohio; and the Westinghouse X-ray Division.

Possibly the largest electrical manufacturing job ever undertaken by an American firm is the contract to build the electric generators for the Grand Coulee power house. Westinghouse completed and delivered the first of three identical 108,000 kilowatt waterwheel generators for this great power station in January, 1941.

The second of these machines was shipped from the East Pittsburgh Westinghouse Works last April, and the third generator is now being assembled for mechanical tests at East Pittsburgh, preparatory to shipping it.

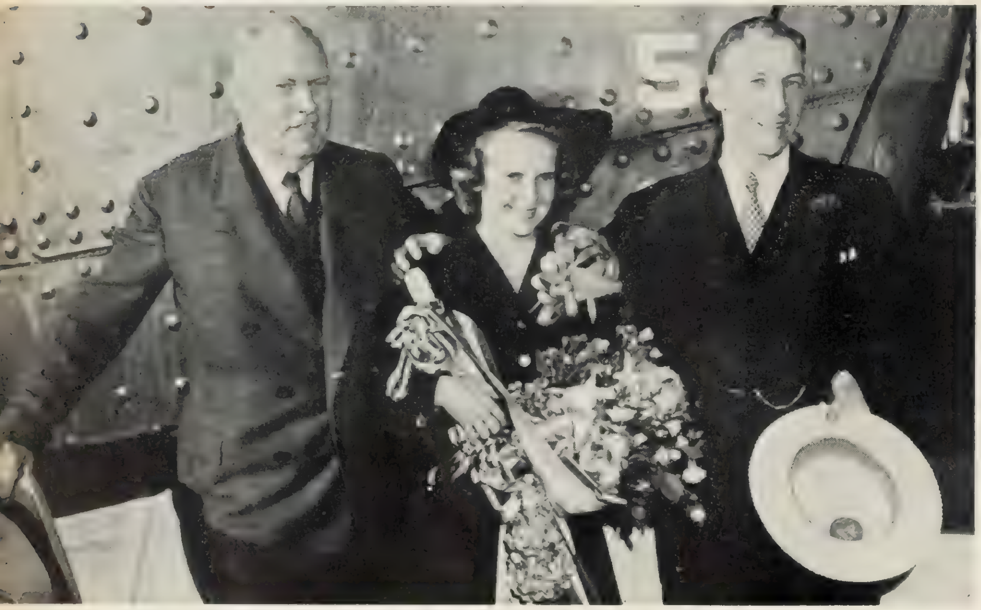
These generators will supply power to pump water from the Columbia River for irrigation purposes.

Thirty-eight freight cars are required to carry the 1000 tons of parts that form each of these power machines. Each generator is 24 feet high and 45 feet in diameter. Heaviest parts are the steel frame, the "spider"—a single piece of steel weighing 50 tons and used to support the rotating mechanism, and the 56-foot shaft which weighs 150 tons.

Involved in the production of one of these Grand Coulee generators are: approximately 333,000 man hours of labor; 750 tons of steel; 77 tons of copper; 116 tons of stator laminations; 71 tons of pole laminations; 214 tons of rotor laminations; 96 tons of steel castings; nine tons of cast iron; 3500 pounds of alloys; 3000 pounds of brass; 165,000 square feet of mica insulation; and 355,000 feet of insulation tape.

Bethlehem Launches

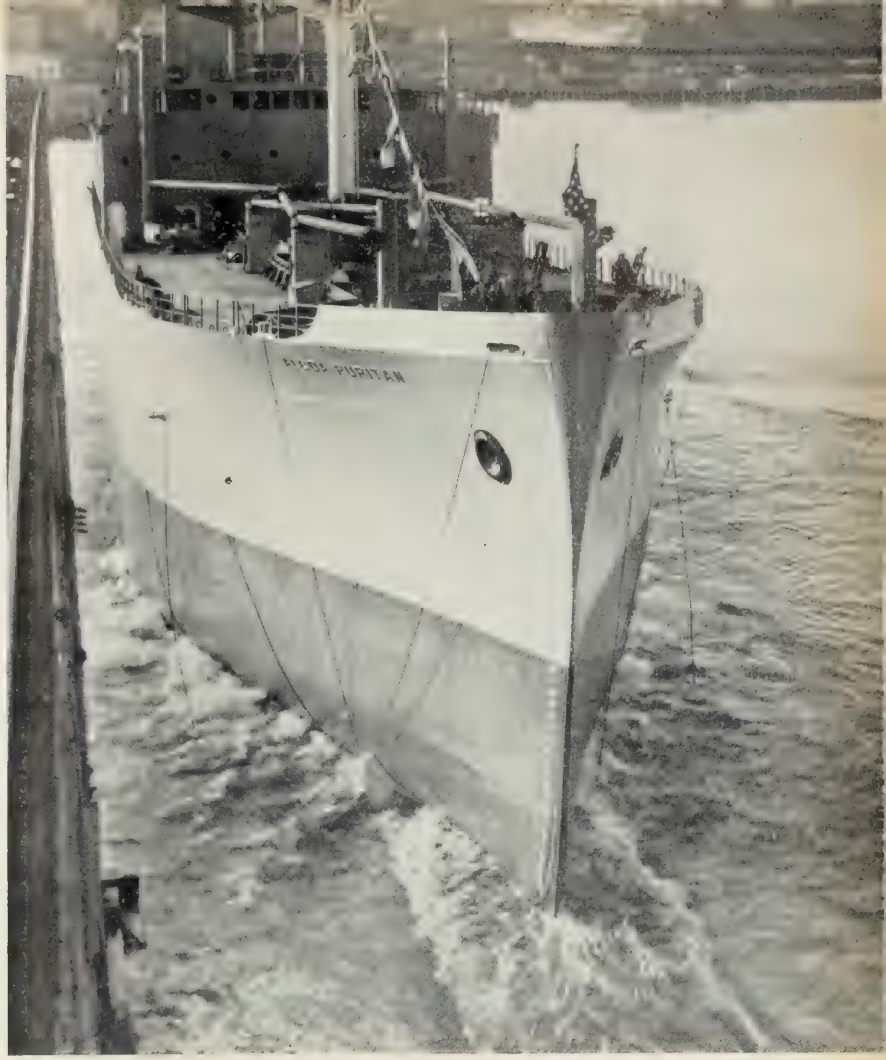
Last of 5-C-1s



The pictures on these pages were made from photographs taken at the launching of the C-1 Alcoa Puritan, July 3, 1941, at the San Francisco plant of the Shipbuilding Division of the Bethlehem Steel Co., Inc. The sponsor is Miss Marilyn Claire Anderson, a winsome lass who taps ships with the bottle very gently but very effectively

She is attended by her father, M. M. Anderson, personnel director of Alcoa S. S. Co., Inc., and by A. S. Gunn, general manager of Pacific Coast yards, Shipbuilding Division, Bethlehem Steel Co., Inc.

Alcoa Puritan for Maritime Commission



The Alcoa Puritan is the last of a group of five C-1 cargo steamers built at this plant for the U. S. Maritime Commission. First of these, the Cape San Martin, was allocated to the Grace Line, Inc. The other four are for the Alcoa S. S. Co., Inc. With the launching of Alcoa Puritan, the Pacific Coast yards of Bethlehem will be dedicated to naval work, largely destroyers and cruisers

News FROM THE PACIFIC SOUTHWEST

by K. M. Walker

As of July 15th

Electric Welding Produces Interesting Results

The decision of the owners of the iron sailing ship Star of Scotland to do all the work of rebuilding and rigging the historic ship into a six-masted schooner at Newport Beach, without benefit of a shipyard, created some difficult problems in working the heaviest materials. These problems were further complicated by the difficulty in obtaining the use of heavy machine tools at the few available plants due to their load of defense and other work.

When it became necessary to bend the 3″ x 6″ poop deck beams to the proper camber it was found that no "bulldozer" was available and it appeared that it would be necessary to truck these beams to Los Angeles and have them bent in some steel plant to template. On hearing of the problem, the welder employed on the ship offered to tackle the problem. A wooden template of the logarithmic curve adopted for the camber of the deck beams was made and laid flat on a wooden work board placed on the main deck. The steel angles were laid over the template with the six inch face down and the short heel of the angle turned up. The electrode was then applied over a series of welds about an inch and a half long, made one at a time, near the outer edge of the six-inch face. These welds were spaced about a foot apart and made a flux of the steel where the electrode was applied. There was no building up of the weld but the material of the angle over these areas was brought to a "melt." When one of these welds was completed, it was immediately quenched with cold water. The result was that, in cooling and contracting, the welded area developed a powerful constricting force, or "draw," and the beam could be seen to swing gradually into an arc. When the required curve was attained, the quenching was stopped and the beam took a set and was allowed to cool gradually without developing any further apparent curvature. Beginning at one end, the entire beam was treated step by step in this manner and the final outcome was a deck beam cambered perfectly fair to the eye without the aid of any machinery, outside of the welding generator, and requiring only a few pieces of wood and the template and relying only on natural physical laws to bend the relatively heavy beams.

This method has proven so successful that all of the modeling of poop, forecastle, bulwark and other frames and beams will be done in this manner. Not only is there a saving in freight and the hire of machine tools but, of prime importance, time. It seems that old "Dame Necessity" is as fertile a mother as ever. An analysis of the internal stresses set up in this method of bending strength members would be interesting.

London's Yacht Snark Located

About fourteen years ago, without pomp or requiem, an old sloop bearing the name, Saucy Lass, was towed into the little inlet off the West Basin of Los Angeles Harbor and unceremoniously shoved into the mud and left to be the forlorn prey of the beachcomber and the poor in search of wood. The hull slowly rotted and settled into the mud and decking, houses and deck beams were filched for firewood, while youngsters played at pirate and sailor in the sagging wreck.

Now it has developed, on investigation, that the skeletal remains of the Saucy Lass is none other than Jack London's ill-starred but far-famed Snark. Built in Sausalito at huge expense and outfitted in the same way, due to the unbusinesslike and lackadaisical way of the popular fiction writer, she made one long voyage to the South Sea Islands. Here London contracted the unpleasant disease known as "yaws," common to the Southern Archipelago, and overexposure to the sun caused the author's hands to swell, rendering him helpless. This forced hospitalization in Australia, where the Snark was sold. She was next heard of as a trader and blackbird ship in the New Hebrides and later turned up in the Bering sealing business. With prohibition she was turned to bootlegging and smuggling along the Pacific Coast. She finally wandered into Los Angeles Harbor, a tawdry and bedraggled wench of the sea, and the tired heap of rotting timbers is all that is left of the inspiration for "The Voyage of the Snark."

Ships To Aid Aluminum Demand

With the United States facing a need for over a billion and a half in poundage of aluminum, the Alcoa Steamship Company is rushing to completion its program of eleven ships, eight of 9400 tons deadweight, and three of 7000 tons, to carry bauxite ore from South American sources.

On June 27, the Consolidated Steel Corporation plant at Long Beach launched the Alcoa Pennant, the sixth of the eleven ships being built in Long Beach and San Francisco for the subsidiary of the Aluminum Company of America. This is one of the 9400 ton ships and another is under construction at the Consolidated plant.

Shortage of Licensed Personnel

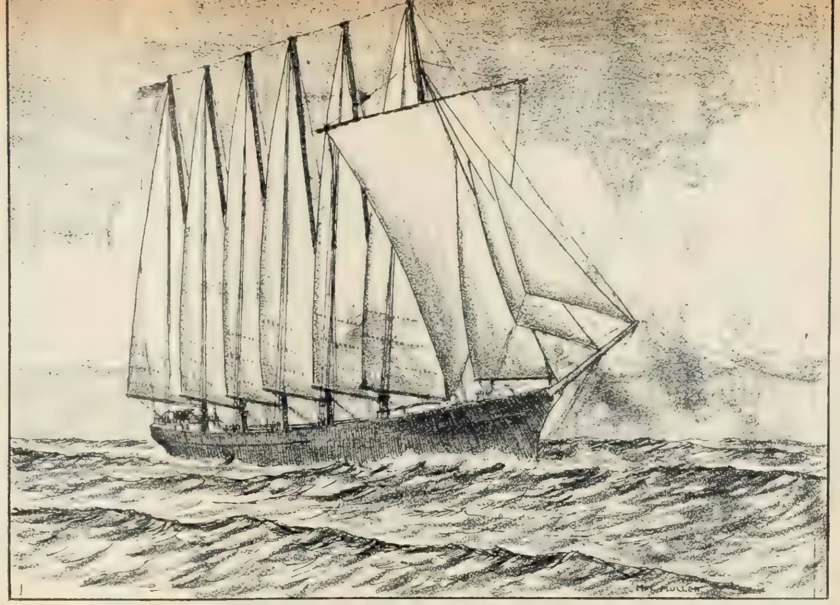
The drain on the limited supply of licensed officers by the call to naval duty of reserve officers and the more lucrative shore jobs now available to engineer officers has brought about a difficult situation in manning the tuna clippers operating out of Los Angeles Harbor and San Diego. On her last voyage the Atlantic had trouble getting a chief engineer. Before one was located she nearly sank as the temporary engineer, being unfamiliar with the piping arrangement, went ashore and left a valve open. The engine room was partially flooded and the bait pump and ammonia compressor motors were ruined before the condition was found.

The San Salvador was delayed a number of days as a licensed mate could not be had. The American Fisherman's Tunaboat Association then took the matter in hand, for the benefit of her owner and for owners of other boats which might be so affected, and wired Capt. R. S. Field of the Bureau of Marine Inspection and Navigation at Washington, D. C. A reply was received through the San Diego Customs House from the Department of Commerce in Washington informing them that if the San Salvador, or any other fishing vessel of over 200 tons, applies for clearance the vessel should be allowed to depart but that the navigation fine, $100 for each offense should be added. This appears to be an anomaly, but is apparently in the nature of a signal observation of the navigation laws. The Department of Commerce indicated that they would give consideration to petitions for relief from such a penalty.

Season's First Log Raft Suffers Damage

En route to San Diego from the Columbia River in tow of the Red Stack tug Sea Lion, the first of the Benson Lumber Company's log rafts came to grief off San Francisco July 7 during heavy weather and broke into two sections. The tug Sea Ranger was sent to pick up the free section and both tugs proceeded toward San Diego with a half of the 900-foot raft apiece. A few of the long logs were lost and became a menace to navigation. The Coast Guard issued warnings to navigators and a number of the logs were picked up by the cutter Pulaski inside the Golden Gate.

On July 15, the two sections were delivered to the Benson Sawmill in San Diego with a minimum loss reported.



Star of Scotland as a 6-masted schooner will appear thus under full sail

(Reproduced from a sketch by Jerry McMullen in the San Diego Union Tribune, *made from the plans of the architect, K. M. Walker)*

Shark Livers Offset Poor Market Fishing

The complaint of the small fresh fishing boats of no fish on the banks local to San Diego is offset by the unprecedented price of seventy cents a pound for shark livers. The result has been that half of the smaller boats have turned to shark fishing and have abandoned the food fish business. One of the small boats, with a total crew of five, was out four days and netted each man a clear thousand dollars as his share. Over fifty of the San Diego fleet of small boats is engaged in shark fishing and report average daily catches of three tons of shark. The livers weigh about ten pounds each.

The carcasses bring a little as fertilizer, but there is practically no other use for these fish at present. The Chinese market for the fins is gone but the fishermen's associations are casting about for a market for the skins and are contacting the eastern shoe and luggage manufacturers for a possible outlet. This will take some developing but may bring another business to the southwest.

Yard Notes

Frank Hodgson, who entered the shipbuilding business by building the 80-foot tuna clipper Gertrude in a lot off Seaside Avenue, Terminal Island, has acquired a piece of land at Long Beach and will set up a yard to build two more similar vessels this fall. The Gertrude is nearing completion with a 310 hp diesel main engine and two 60 hp auxiliaries.

The Dorothy Lee, built for Frank Medina at the General Marine Works in San Diego, is receiving the finishing touches and tuning up of her machinery. Work on this vessel was done by Hollinger and Millican, who have now built a new yard on the south side near the foot of 28th Street, where they are building a seventy footer for Victor Bregante. While the Dorothy Lee is being finished at the General Marine plant, the keel of the Bregante boat has been laid at the new plant on the south side as the new Harbor Drive, scheduled for early construction, will leave the north side boat yards high and dry.

The Mexican Patrol Boat being built at the Harbor Boat Works in San Diego is being decked and all who have seen her proclaim her a "sweet" model. Designed by Pete Rask for a speed of twenty knots, and having a modified "V" bottom, cambered transom stern and overhang bow, she resembles the old 110-foot subchasers. Eighty feet long and with a beam of 15 feet her two 450-hp National-Superior diesels should drive her easily at the contract speed.

At the San Diego Marine Construction Company, things are humming with two of the four Navy mine sweepers in frame and the keel of a $75,000 tug for the Star and Crescent Boat Company about to be laid. This latter will have a 460-hp Washington Diesel main engine and a 45-hp auxiliary. The boat will be named San Miguel. The San Diego Marine

(Page 59, please)

News FROM THE PACIFIC NORTHWEST

by Daniel L. Pratt

As of July 15th

Two Million-Dollar Piers for Seattle Port

In order to take care of the immensely increased shipping activity out of the port of Seattle, resulting from defense work in Alaska, increased Oriental and coastwise business and especially the possibilities of a greatly increased business with war-beset Russia, the Seattle Port Commission has announced that it will proceed without delay in the construction of two new piers at a cost of a million dollars each. The new docks will be located at the foot of Connecticut Street, being flanked by the Army Quartermaster's Depot, Pier B, on the south and the Pacific Coast Co. pier on the north. Each new pier will be 1000 feet long, 400 feet wide with one-story transit sheds for storage purposes. Between the two will be moorage space 350 feet wide. Shippers are being given an opportunity by the U. S. Engineers to file complaints as the two piers will extend 89 and 139 feet, respectively, beyond the pierhead lines established for that section.

Great New Army Warehouse Started

In connection with the Army Quartermasters program along the South Seattle waterfront, announcement has been made of a contract with the Western Construction Co., Seattle, for a concrete storage building at 1519 So. Alaskan Way. It will be at the corner of Alaskan Way and Massachusetts Street and will be 363 by 314 feet.

Cape Fairweather Goes to Owners

Cape Fairweather, third of the C-1 type motorships to be completed by the Tacoma plant of the Seattle-Tacoma Shipbuilding Corp., was delivered to its owners, the American Mail Line of Seattle, on July 8. Capt. J. F. McDougall took the ship over for the operators, and without delay she shifted to the Shaffer terminals and started to load flour and general cargo for the Orient. Later, she was to shift to Seattle, then to Vancouver, B. C. and was destined to sail direct from there to the Orient. Cape Fairweather is a sister ship of the Cape Alava and Cape Flattery, which have been described in detail both in text and photos in the May and June issues of PACIFIC MARINE REVIEW.

Two Other C-1 Type Vessels Sold

Walter Green, plant manager at Tacoma for the Seattle-Tacoma Shipbuilding Corp., announces that the last two of the five C-1's they have built and launched have been sold to the Pacific-Atlantic Steamship Co. of Portland, Oregon. The Cape Cleare will be renamed the Oregon and the Cape Douglas, the Idaho. Both of these two vessels were launched some time ago and are being rushed to completion. The Oregon will be delivered about August 8, and Capt. E. R. Gillette, who is to be in charge of her, has been in Tacoma for some weeks awaiting completion of the vessel.

Rescue Ship Goes To East Coast

Famous in many daring rescues in battling winter gales when lives and ships were at stake, the old Coast Guard cutter Redwing has left the Pacific, possibly not to return. July 7, under orders from Coast Guard headquarters at Washington, D. C., she sailed from her present base at Port Angeles, Washington, for New York where she will report to the New York division for further orders. Stationed for several years at Astoria, Redwing, which is an unusually staunch and powerful hull of the tugboat type, figured prominently in daring rescues off the bar, her most famous one being in 1934 when, after a terrific battle with the seas, she pulled the stranded Norwegian vessel Childar from the treacherous sands of Peacock Spit, for which her crew and officers were awarded medals for bravery. She has also done her part in the annual seal patrol and made a number of scientific cruises to northern waters.

Dutch Harbor Base Being Rushed

In view of the German attack upon Russia, new importance has been attached to the speedy completion of the defense bases in Alaska, and it is now announced that the new naval air station at Dutch Harbor, Alaska, will be completed September 1. The tip of Siberia is only thirty miles from the western reaches of Alaska, and the possibility of German threats from that sector has speeded up work on all of the northern bases. Especially busy at this season is the Alaska Steamship Co., whose ships are sailing with capacity loads for Dutch Harbor, Unalaska, and Kodiak. Army bases at Fairbanks and Anchorage are being served largely by Army transports. Commander Wm. N. Updegraff, who has been on duty at Pearl Harbor, will be in charge of the station at Dutch Harbor.

Terminal Group Selects Officers

At the annual meeting of the trustees of the Northwest Marine Terminal Association held in Portland June 25, the following officers were elected for the ensuing year: H. W. Hall, assistant general manager of the

East Waterway Dock & Terminal Co., Seattle, president; Philip H. Carrol, executive secretary of the Commission of Public Docks, Portland, vice president; W. F. Varnell, manager of the Dockwell Dock & Warehouse Co., Seattle, treasurer; J. R. West, (reappointed) executive secretary. At the annual meeting of the association held June 19, the following were elected trustees: Col. W. C. Bickford, manager, Port of Seattle; Geo. W. Osgood, manager, Port of Tacoma; C. E. Lingerman, manager, Baker Dock Co., Tacoma; Geo. Powell, Oceanic Terminals, Portland; K. C. Covers, district manager, McCormick Steamship Co., Portland; Ernest Gribble, manager, Port of Olympia; W. J. Murphy, manager, Port of Grays Harbor; J. S. Gloman, manager, Port of Bellingham; Hall, Carroll and Varnell.

Olympia Harbor Modernized

Since 1938, various WPA projects completed at the port of Olympia, at the head of Puget Sound, have completely transformed that harbor, especially important because of its proximity to the great Fort Lewis and McChord Field defense works, into a well-equipped and efficient seaport. Nearly a mile of tracks in the switching yards along the docks have been relocated, transit sheds rebuilt, wharves rechecked, and a new transit shed, 70 by 216 feet with loading dock 78 by 248 feet, built. New firewalls and 360 feet of track extension were rebuilt and 600 feet of tracks relaid. At berth No. 4, 130 feet of standard gage double tracks will permit switching freight cars from the yards to the end of the pier. A new addition to transit shed A was also built and forty new concrete piers placed under the dock. $92,000 worth of WPA labor has been used and the Port Commission has expended over $100,000 for equipment and material.

A Boom in Russian Trade?

Puget Sound shipping men are speculating on the possibilities of another great boom in shipping between this port and Vladivostok as a result of the German-Russian War. Twice in past history, once during the Russian-Japanese War and again during the World War, the Puget Sound district has stood second only to New York in the value of its exports and imports. While the trade with Russia during the past year has been heavy, it was hampered by export restrictions, but under present conditions it is considered likely that restrictions on wheat and other commodities will be removed in view of the fact that new conditions make impossible diversion of Russian shipments via Vladivostok to Germany. Canada is said to be already on the verge of lifting the ban recently placed on shipments of wheat to Siberian ports.

M. S. Cape Fairweather, new C-1 motorship of the American Mail Line, loading flour for the Orient at Fisher Bros. mill, Seattle

Ferry Arrives In Seattle

The Shasta, another one of the big ferries purchased by the Black Ball Line of Seattle from San Francisco interests arrived safely on Puget Sound July 16, coming up the coast in tow of the tug Goliath which will later return for her sister ship San Mateo.

Shasta and San Mateo are two of the six ferries recently purchased by the Seattle company. Both are steel-hulled, 14 knot vessels under steam.

Anchorage Again Becomes a Port

Owing to defense activities involving the construction of a great Army base at Anchorage, Alaska, that city is again to become a recognized port. The Geodetic vessel E. Lester Jones has completed a survey of the approaches, which, on account of an average 35-foot tide and dangerous shifting shoals, are very difficult. Since the survey, the Jones has piloted one of the largest U. S. Army transports into the harbor. However, navigation into Anchorage is not yet a job for amateurs.

Two New-Type Vessels Christened at Bremerton

Ships built at the Puget Sound Navy Yard are not launched but are simply floated in the immense drydocks. Nevertheless, the simultaneous christening of the two new seaplane tenders Biscayne and Barnegat on July 3 was marked with colorful ceremonies, both because it was the eve of National Independence Day and also because the vessels are the first of an entirely new type for the Navy. The two ships, moored side by side, presented an unusual picture. They are of about the same displacement as the new destroyers, but different in appearance as there are no portholes, and huge cranes are mounted aft to hoist seaplanes aboard for inspection and repairs. Two sister ships, Casco and Mackinac, are already under construction at the Navy Yard. Ten more are under contract and work started at the Associated Shipbuilders and Lake Washington Shipyards, Seattle. Present, in addition to high ranking Army, Navy and Marine officers, were Governor Langlie of Washington, Mayor Harry Cain of Tacoma and Mayor Homer Jones of Bremerton and their ladies. Principal speaker was Rear Admiral C. S. Freeman, commandant of the Thirteenth Naval District. The vessels were christened by Mrs. Alex M. Charlton, wife of the manager of the yard and Mrs. Lucien F. Kimball, wife of the captain of the yard. Flower girls were the Misses Alice Brown and

Shirley Jean Pritchard, daughters of civilian yard employees. In his address, Admiral Freeman said the double christening was designed to bring together the men who produced the ships and the men who will operate them. After the christening, the crowd shifted to the other end of the dock to see the two vessels turned over to their commanders—Barnegat to Commander F. L. Baker and Biscayne to Lieut. Commander Carlton C. Champion.

Ship Conversion Ruling

Pacific Northwest shipbuilders are still speculating at this time upon the edict of the navy department, issued July 11, that hereafter, on account of the high labor cost prevailing on this coast, all conversion work will be transferred to the East. Rate for skilled mechanics at Seattle on repair work has been $1.25 an hour and upward. On new ship work, under the recently signed labor pact, the rate is $1.12. Double rate is paid for overtime on conversion work and only time-and-a-half on new work. When it is considered that a much smaller controversy than this tied up the entire shipbuilding industry of San Francisco for weeks, there is considerable speculation as to why this differential should be brought up at this time. However, time will probably furnish the answer. It is understood that work of converting the President Hayes will be transferred from the Willamette Iron and Steel yard at Portland to an eastern yard, but that the work on the President Jackson, already well under way, will be completed there. Work is also to be completed on the two conversion jobs at the Todd Drydocks in Seattle, on the U. S. S. Zeilin, formerly the President Jackson and the U. S. S. Harris, formerly the President Grant, contracts that involve about $6,000,000.

Marine Shorts

Frederick Funston will be the name of the first of the two Army transports now under construction at the Tacoma plant of the Seattle-Tacoma Shipbuilding Corp. This will commemorate the services of the newspaper man who became a brigadier-general in the Army for his bravery in capturing Aguinaldo, the leader of the Philippine insurrection. The second transport will be named James O'Hara after the Irish-born immigrant who was the first Quartermaster General of the United States Army. The keel of Funston was laid April 21, and of O'Hara June 16.

* * *

Commandeering of coastal vessels for National Defense is depleting the services between Seattle and California. One of the greatest sufferers has been the McCormick Steamship Co., which now only has one vessel on the regular route. The company, however, is still operating five ships in the intercoastal trade on monthly sailing schedule.

* * *

Heavy cargoes are being carried by the American Mail Line on its transpacific voyages both east and westbound. Shipments moving to the Pacific Northwest include hemp and ore from the Philippines, gunnies from Calcutta and tea from Ceylon, transshipped at Hong Kong.

* * *

The Seattle Quartermaster Depot may use the ports of Tacoma and Olympia as temporary embarkation points if a shortage of pier space occurs in Seattle. Speaking recently before the Pacific Northwest Advisory Board, Lieut. Col. C. O. Thrasher stated that pier facilities in Seattle may be taxed to their limit by the millions of tons of materials and equipment necessary to supply garrisons in Alaska.

* * *

Keel for the first of four $4,545,000 seaplane tenders to be built for the Navy by Associated Shipbuilders of Seattle was laid at the company's Harbor Island plant June 31. These craft, 320 feet long, will take about a year to finish. The other keels will be laid while the first vessel is under construction. The first keel was laid in one of the huge graving docks used to construct the concrete pontoons for the Lake Washington floating bridge. The tenders, like those just finished at Bremerton, are used for the care and repair of the Navy's seaplanes and flying boats, including the big bombers, when a land base is not available.

* * *

The third speedy freighter built for the American Mail Line of Seattle, in the East, Japan Mail, was launched at Chester, Pennsylvania, July 26, with Seattle executives present, and Mrs. Sam L. Barnes, wife of the chairman of the American Mail's board of directors, acting as chairman. Vessels already launched for the company at Chester include the China Mail and the Island Mail, which are in addition to the three ships built at Tacoma, the C-1 type motorships Cape Alava, Cape Flattery and Cape Fairweather.

* * *

Plans for a new naval air station to be built on Whidby Island at the foot of Puget Sound and the head of the Strait of Juan de Fuca have been revealed in Seattle by dispatches from Washington, D. C. The new station, initial cost of which is to be $3,790,000, is part of a $20,000,000 naval expansion to be authorized immediately as a result of Germany's new war on Russia. The new base will be used as an emergency field by Navy planes winging their way in from the Pacific, and aircraft carriers in Puget Sound waters will also use the field as a base for part of their planes.

Short Shorts

The seventeen-hour test run made by the Cape Fairweather around Puget Sound before she was turned over by the Seattle-Tacoma Shipbuilding Corp., builders, to American Mail, operators, was considered to have been the shortest test run on record for ships of this type.

Members of the Transportation Club of Seattle had planned a short vacation over the week-end of July 26 in the form of a mass trip to the Skagit dams on what is known as the City Light Skagit tour, an experience that is said to pack more scenery, educational interest and general fun into two days than any other tour known in the Northwest.

Walter McCray, Seattle submarine diver, has recently acquired a brand new outfit to aid him in the work he has been carrying on for 12 years. It includes a power barge capable of an 8-knot speed, aboard which is a compression chamber, living quarters for four men and all the necessary equipment needed by a deep-sea diver.

The trim, white ships of the U. S. Geodetic Survey are to be the next fleet turned over to the Navy. This includes Discoverer, to be delivered upon her arrival in Seattle from Alaska; Guide, which has already arrived in Oakland and been ordered to San Diego; and Pioneer, due soon in Oakland from Alaska.

The new channel into Grays Harbor, scoured out by waves and current, is now open, as most of the important buoys have been installed and others will be placed shortly. Markers on the old channel will be left till September 15.

The Federal government took steps at Portland on July 15 to transfer ownership of the seized Italian ship Leme to the United States.

The veteran tug John Cudahy, now laid up on the Columbia River, has been purchased by the Foss Co. and will be brought to Puget Sound in the near future.

New figures just issued by the U. S. Customs show that the Puget Sound district now has 19,529 registered motor boats, an increase of 3,441 over last year, which puts this district second only to New York in its small boat fleet.

Seattle's Harbor Patrol Boat No. 1 is having a new power plant installed, a 160 hp General Motors marine diesel, replacing 70 hp of an older make.

Personal Gleanings

Capt. E. L. Bush, who was commander of North Star on her two trips to the Antarctic, will command the U. S. Bureau of Indian Affairs vessel Boxer, which left Seattle for Alaska July 20 for Indian stations in the north with 3,000 tons of supplies aboard . . . Mrs. Reed Knox of Byrn Mawr, Pennsylvania, has been designated by the Secretary of the Navy to sponsor the destroyer Cook, under construction at the Seattle plant of the Seattle-Tacoma Shipbuilding Corp. The ship was named after her grandfather, the late Commander Roderick S. Cook. . . . Capt. John S. Smith who commanded the American Mail liner on her first voyage to the Orient has now been appointed captain of the company's new 13,876 ton cargo-passenger ship China Mail, now being finished at the Sun Shipbuilding & Drydock yards at Chester, Pennsylvania. . . . Under command of Capt. Roscoe Smithe, Cape Alava has already left on her second trans-pacific trip. . . . Another well-known mariner has been called into defense service. Capt. A. O. Lustie, at one time commander of H. F. Alexander and other vessels has reported as Assistant Captain of the Puget Sound Navy Yard. . . . Dwight Long, youthful Seattle small boat mariner who made a voyage around the world in his 32-foot ketch Idle Hour and who is now off on a second voyage, has been reported as arriving safely at Honolulu.

C. G. Takes Over Radio-Direction Stations

Radio Direction-Finder stations at the entrance of Juan de Fuca Strait, on Tatoosh Island, and at Klipsan Beach, formerly operated by the Navy, and used to help keep ships on their bearings, have been taken over at naval request by the U.S. Coast Guard, together with similar stations in Oregon, California and the Gulf Coast. This transfer was made under a personal agreement between Secretary Knox of the Navy Department and Secretary of the Treasury Morgenthau. Twenty-two stations are affected. This is the first announcement of any transfer of duties from the Navy to the Coast Guard, although there have been many cases involving transfer of vessels, men and functions from the Guard to the Navy. The move is considered logical, however, as operation of these stations comes well within the line of similar Guard activities and lessens the strain on the Navy. This is especially true as both naval and merchant marine vessels use this service.

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Southwest Marine News

(Continued from page 55)

launched the Soares Brothers 70-foot tuna boat Sea Hawk on June 23, which boat is now at the outfitting dock.

The Campbell Machine Works of San Diego have started planking the 108-foot tuna clipper for Tony Tavares and M. Ferriera. They have also laid the keel for a 128-foot clipper for John Vattuone and Sons, which boat will cost approximately $210,000.

The Martinolich yard in San Diego has three boats under way and will soon launch Frank Perry's 103-foot tuna clipper. The cost of this boat will be $145,000. Another 103-footer will be for Manuel Madruga and will cost about the same fully equipped. The largest boat building at this yard is a 140-footer, the largest now building in San Diego, to the order of Andrew Castagnola at a cost of about $225,000.

Quartermaster Corps Finds Substitutes For "Critical" Materials

Every effort is being made by the Quartermaster Corps to ease the demands that its enormous purchases of equipment for the Army make upon the available supplies of the so-called "critical" materials for which a shortage is either present or may arise soon under the National Defense Program, according to the War Department.

In carrying out this work, a great deal of research has been necessary because of the large number of items procured by the Quartermaster Corps. In preparing plans for the adoption of substitutes for aluminum, for example, every item procured by the Quartermaster Corps that contains this metal receives a thorough analysis.

Each part of a field range, for instance, for which aluminum has been used in its production, is studied in detail.

The requirements of these parts for weight, strength, hardness and other elements are ascertained, then a search is made of materials not on the "critical" list, or expected to be placed on it later, for one that will best meet the requirements of the aluminum unit to be replaced.

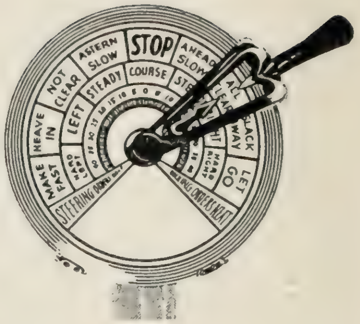
In most instances, it has been possible for the Quartermaster Corps to find a substitute material that will provide as good, or nearly as good service, as the original. In a few instances, the detailed analysis of the materials used has resulted in improvements.

In the determination of substitutes for aluminum, not only must the field range be taken apart and analyzed, but the same procedure must be followed for every other item of Quartermaster equipment that contains this metal. There are about 90 items procured by the Quartermaster Corps that use aluminum.

The same procedure was followed in seeking suitable substitutes for the other items of materials now on the "critical" list. This list now includes, besides aluminum, cadmium, chromium, copper, cork, ferrous alloys, lead, machine and metal working tools, magnesium, neprine, nickel, including Monel metal, non-ferrous alloys, tin and zinc.

Steady as you go!

KNOWLEDGE IS THE STRAIGHT COURSE TO ADVANCEMENT



A Department for Deck Officers

by "The Skipper"

Questions Welcomed. Just Address "The Skipper," Pacific Marine Review, 500 Sansome Street, San Francisco, California

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CARGO HANDLING

I—INSPECTION OF HOLDS

General Comment

We have for the past months been studying the stowage of cargo, and the use of cordage and wire rope on shipboard. This brings us naturally to the subject of cargo handling and cargo gear—probably the most important subject in the economic phases of ship operation.

The methods in use for loading and unloading general cargo have seen little change in the past two or three generations. There has been immense improvement in the design and operation of the equipment and mechanisms used, but the method is still that of hoisting off the dock or out of the hold, swinging over the ship's side, and lowering into the hold or onto the dock. On the dock or in the hold, the parcels are distributed or stowed largely by manual labor.

While the operating cost per-ton mile at sea has been held at a very low level, and in many instances has been decreasing, the per-ton cost of loading and discharging ships has been steadily rising.

For many years it has been truthfully said that it cost more to load and unload a ton cargo at American ports than to carry that ton across the ocean.

These are factors in modern ship operation to which deck officers should give very earnest study. Deck officers can, by proper supervision over certain details of cargo handling gear, make its operation more efficient and more economical. Some of these details are:

Inspection of hold
Inspection of rope
Inspection of blocks
Care in selection of slings
Lubrication of rope
Lubrication of blocks
Lubrication of fairleaders
Lubrication of goosenecks
Lubrication of winches
Reeving of falls and lifts

Expert attention in these details will go far in minimizing cargo handling costs, accidents and cargo damage claims. Of course, a deck officer who is not interested can say all these things are the business and the responsibility of the stevedore. The wise officer, however, will cooperate with the stevedore by having all his gear in first-class condition for most effective service.

"THE SKIPPER."

QUESTION

Who is responsible for handling and stowage of cargo on the modern steamer?

ANSWER

Usually cargo is loaded and discharged by gangs of longshoremen employed by the contracting stevedore. The stevedore gets paid at an agreed rate per ton—the longshoremen at an agreed rate per hour.

It is the usual practice for the shore personnel of the steamship operator to work out a stowage plan with the stevedore. This plan figures the loading of the cargo: to use the space to the best advantage; to keep the vessel in good trim and in a stable condition; and to locate the various parcels so that they are in good position for the discharge schedule.

It is the responsibility of the stevedore in consultation with the captain to see that this stowage is followed as closely as is practicable, and to see that the cargo is stowed with the least possible damage in the process.

It is the responsibility of the captain and the first mate: to have the cargo space in good condition; to see that dunnage where necessary is properly applied and secured; to see that stowage is made in a manner that leaves no chance of shifting in a seaway; to properly secure all openings against the entrance of sea water; and to maintain proper ventilation.

The stevedore is responsible for the safe delivery from dock or lighter to ship's cargo space.

The ship's officers are responsible for the safe delivery at port of destination.

Although the captain, today, has practically no control over the choice of cargo his vessel is booked to load and carry, yet in every case he signs the ship's papers signifying that he has received that cargo in good order and has loaded and stowed same. It is therefore his sole responsibility to deliver that cargo in the same order and condition in which it was received by him.

QUESTION

What should be included in hold inspection?

ANSWER

For proper hold inspection, a group should be made up including the captain and/or the first officer, a junior officer or two, the chief engineer and the carpenter. This group should inspect: all 'tween deck scuppers and drains; all bilges with their rose boxes and sounding tubes; all cement caps, limber boards, and ceiling on tank tops and bulkheads; all sweat boards and space between these boards and shell plating; all pipe lines and overboard discharges; all electric wires; all deck plating for leaks, particularly in way of masts, king posts, ventilators and winch foundations; all side ports; all hatch boards; and all hold ladders. This inspection group should make sure that the hold and 'tween decks are sufficiently clean and dry to receive type or types of cargo to be carried.

After this inspection a note of the findings and the repairs made should be inserted in the log book and signed by all members of the group. A special report of the inspection together with recommendations should be sent to the port captain.

At sea bilges should be sounded at least twice a day and inspections of all cargo spaces made periodically. It is important that findings of these actions be regularly entered in the ship's log book.

QUESTION

What other entries as to cargo should be made in the log book?

ANSWER

It is very important that everything pertaining to cargo at sea be entered in the log book. The most trivial entry may later become the deciding factor in settling a damage claim. The log book record is your protection and you should make it concise and clear, but comprehensive enough to cover all the facts bearing on the matter in hand. A day-to-day record should appear in the log book showing how cargo is being ventilated, and how each cargo compartment is reacting to this treatment.

QUESTION

What are the functions of dunnage?

ANSWER

Dunnage is material used for many purposes in the stowage of cargo. Among these purposes are: raising cargoes off decks or floors for drainage to bilges; protection of cargo against chafing; separating shipments; making passages for ventilation; making false floors for fragile cargo; making temporary bulkheads, gratings and linings; and shoring, chocking and tomming cargo.

It will be noted in these uses that dunnage comes into intimate contact with the cargo and usually under a pressure contact. It is therefore highly important that dunnage be carefully inspected before being used. The usual form of dunnage material is a wooden board and in the past tremendous damage claims have resulted from the notion that any old wooden boards would do for this purpose.

In all well-regulated ship operating organizations, dunnage is very carefully selected and maintained in good order. Well seasoned pine, hemlock, or spruce, free from resin and pitch spots, make the best dunnage. Redwood, oak and mahogany are not permissible on account of chemical reactions on many varieties of cargo.

Dunnage is, of course, used over and over. Its contacts with certain types of cargo makes it unfit for use with other types unless reconditioned. Minute quantities of certain chemicals adhering to dunnage boards have caused great damage to other cargoes when used again without thorough cleaning.

Green lumber, wet lumber, or seasoned lumber that has incrustations of salt or salt water content, should never be used in contact with cargo. Always inspect dunnage carefully, and, if it looks doubtful, either make, or request the cargo surveyor to make, a chemical test.

Deck Officers' Licenses for June

Name and Grade	Class	Condition
SAN FRANCISCO		
E. M. Brown, Master	SS, any GT	RG
A. M. Gordenev, Master	SS, any GT	RG
M. O. Grant, Master	SS, any GT	RG
G. W. Peterson, Jr., Chief	SS, any GT	RG
L. M. Sieber, Chief	SS, any GT	RG
T. W. Baker, 2nd Mate	SS, any GT	O
H. M. Isnor, 2nd Mate	SS, any GT	O
K. Wayne, 2nd Mate	SS, any GT	O
R. Bellmer, 2nd Mate	SS, any GT	RG
J. K. Moran, 2nd Mate	SS, any GT	RG
J. A. W. Smith, 2nd Mate	SS, any GT	RG
PORTLAND		
P. O. Bornander, 2nd Mate	SS & MS, any GT	RG
SAN PEDRO		
R. W. Thomas, Master	SS, any GT	RG
D. N. Welch, Master	SS, 6000 tons	RG
W. H. Iliff, Master & Pilot	SS, any GT	RG
P. H. Luther, Master & Pilot	SS, any GT	RG
P. G. Maushart, Chief	SS, any GT	RG
W. C. Meriwether, 2nd Mate	SS, any GT	O
R. D. Graham, 3d Mate	SS, any GT	O

Abbreviations: SS is steamship; MS is motorship; GT is gross tonnage; O is original license; RG is raise of grade. All of these licenses are for ocean service.

QUESTION

What are the rules in laying of dunnage?

ANSWER

There is no set rule that specifically applies to all dunnage application except the general law that the best application is that which gives adequate cargo protection with the least amount of dunnage. The most frequently used form is 1" x 6", rough, No. 3 common pine in random lengths of 10 to 16 feet.

Each location in the hold and each type of cargo require different dunnage applications. With some small package or sack cargo, it is necessary to dunnage the sweat boards to prevent squeezing through and contact with the sweat of shell plating.

The officer should supervise application of dunnage in the interest of the owner and with a view to the protection of his own reputation for carrying cargo through in good order.

QUESTION

What is meant by an "Exception to Cargo"?

ANSWER

Any ship's officer receiving cargo or supervising its loading and stowage may and should make a formal exception to any irregularity he observes. Broken boxes, damaged cases, leaky barrels, or anything indicating that any part of the cargo is not in prime condition for the voyage are good causes for a formal exception. Shortage in weight or in number of packages are the usual exception motivation.

Usually the operating firm has a regular report form on which these exceptions are entered and these forms should be properly filled out with the necessary information, signed by the stevedore, foreman and the supervising ship's officer and turned into the operating department, where they are attached to the bill of lading and relieve the operator of the responsibility of delivering something he did not receive.

Advice from The Bureau

Navigating officers of American merchant vessels are urged by the Bureau of Marine Inspection and Navigation, Department of Commerce, to use the sextant as a safety factor to work out horizontal and vertical angles of prominent landmarks and aids to navigation in plotting a vessel's position, or to establish danger angles.

It is pointed out that uses of the sextant for purposes other than shooting the sun, stars and, of late years, the moon appear to be comparatively unknown in our merchant marine.

The wrecking of the liner President Hoover on the island of Hoisho To, off the coast of Formosa, a few years ago while on a voyage from Kobe to Manila, is used to give a point to this suggested use of the sextant.

"At three o'clock in the afternoon the vessel made a landfall on the island of Agincourt off the northeast coast of Formosa," says the Bureau. "At this time the weather was clear and visibility good and the vessel estimated solely by dead reckoning that she was twenty-seven miles off the island, abeam. Actually, as subsequent events disclosed, she was only nineteen or twenty miles off and a vertical sextant angle on the peak of the island, which was 465 feet in height, would have demonstrated this."

Another case in point is that of a vessel (en route from the Panama Canal to Galveston, Texas), which recently grounded off Old Providence Island, sustaining bottom damage of approximately $125,000 and having to jettison her entire cargo. Instead of passing the island at a distance of twelve miles to the westward, as recommended in the sailing directions, the vessel endeavored to pass the lighthouse at a distance of two-and-a-half miles, although the chart showed that a shoal extended nearly two miles from the lighthouse. Furthermore, this feat was attempted with the aid of four point and beam bearings, useless under such circumstances, and cross bearings of certain definite points of land on the island which gave an angle at their intersection of only nine degrees. Had such unnecessarily close navigation been justified, it should have been attempted only with the precautionary check of a sextant danger angle.

All candidates for licenses are now examined orally and practically in the use of the sextant and are required to measure both vertical and horizontal angles and to demonstrate their proficiency in using these angles.

Where We Stand Today

by J. G. Ellis

from "The Binnacle,"

California Maritime Academy

In the past month we have begun the eleventh shore term academic schedule of the academy. The first class having entered that little-known institution, called the California Nautical School, located in the hills of Marin County near Tiburon in March, 1931.

How many of us have stopped or paused in our daily duties of being, and studying to become Merchant Marine officers, to think of what the future has in store for us?

In the next few lines let us reminisce. How well the class of 1933 will remember the arduous hours spent in cutting weeds and in painting the buildings that were to become the class rooms for themselves and those to follow. The organization of classes in which engineering, navigation, and seamanship were taught without an ocean-going ship in which to try their hand at the practical side of the seagoing profession.

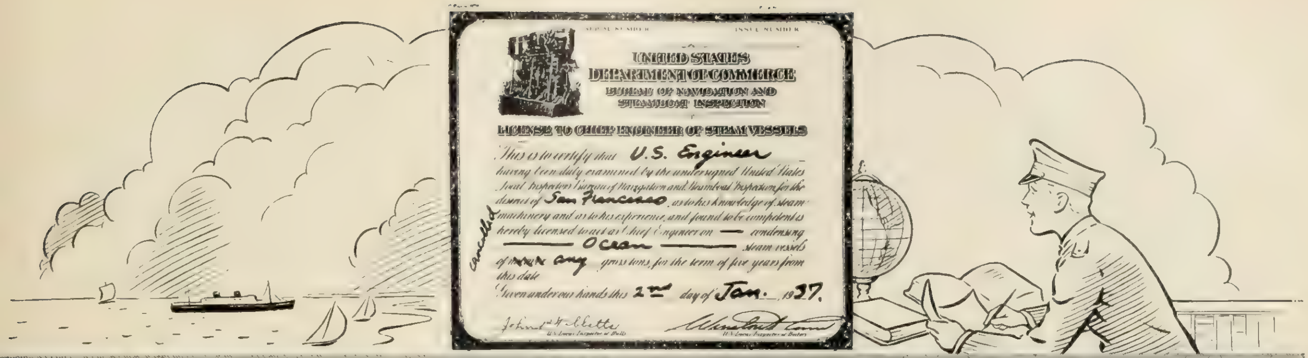
During this time the ship known as the C. T. S. California State was being reconditioned at the shipyard. About the first of December, 1931, the California State made its first appearance at California City and in two weeks another group of prospective officers of the Merchant Marine arrived to take their place as the Class of 1934. In a few weeks the California State sailed on its first cruise with officers directing a green crew of cadets in operation of a 4000-ton ship. Those on board will recall the hours of chipping, scraping, and painting required to place the ship in condition after a lay-up period of twelve years.

During that first cruise, as well as cruises since, many a cadet, and we'll say officer too, has, while at night in their bunks or on watch on deck or in engine room, thought of family, friends and things ashore, weighing them in their minds as to whether their choice of profession had been wisely taken. Some have decided in the negative, but a majority have been in the positive, finding that old saying true: "Once you get the salt of the sea in your blood it is hard to get it out."

Another year rolled around and the Class of 1935 entered. By this time the depression was being felt by all. In the spring of 1933 the days were dark for the California Nautical School. The state, cutting its support until the cadets were doubtful whether they would be able to finish their courses. They questioned, if they did, would they find a job, with ship after ship being laid up for lack of cargoes? By the close watch of finances and hard work of the officers, the classes were graduated and the school kept alive until times were a little better and a new class was entered in the fall of 1935. By this time the graduates who had received their Third Assistant Engineer's or Mate's licenses in 1933-34-35 had, by taking unlicensed jobs at first, been able to prove, through hard work and use of their knowledge, that they could do the job required in the operation of a ship.

During the present emergency jobs are plentiful and the undergraduates and graduates have a different situation than those of previous classes. However, they must not be led to believe that they know it all, but instead, must enter upon that job with the frame of mind that they will do the job to the best of their knowledge, but always willing to take advice or a tip from others with more experience. At present the undergraduates are without proper facilities for classrooms, but should remember the trials of previous classes and do their best with what they have, looking forward to the new facilities being provided.

Those present cadets and those to come in the future should profit from the past and during their time at the Academy should strive to obtain as much theoretical and practical experience as they are able to receive.



SERIAL NUMBER ISSUE NUMBER

UNITED STATES
DEPARTMENT OF COMMERCE
BUREAU OF NAVIGATION AND
STEAMBOAT INSPECTION

LICENSE TO CHIEF ENGINEER OF STEAM VESSELS

This is to certify that U.S. Engineer having been duly examined by the undersigned United States Local Inspectors Bureau of Navigation and Steamboat Inspection for the district of San Francisco, as to his knowledge of steam machinery and as to his experience, and found to be competent is hereby licensed to act as Chief Engineer on — condensing — Ocean — steam vessels of any gross tons, for the term of five years from this date.

Given under our hands this 2nd day of Jan. 1937.

Cancelled

U.S. Local Inspector of Hulls

U.S. Local Inspector of Boilers

Your Problems Answered

by "The Chief"

"The Chief's" department welcomes questions—Just write "The Chief," Pacific Marine Review, 500 Sansome Street, San Francisco, California

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ENGINEERING THERMODYNAMICS

III—HEAT AND HEAT TRANSFER

Heat is a substantial material like all other substances perceptible to one or more of the five human senses. Unlike other substances, however, it can be made to appear in places where there was no evidence of it before, and to disappear. Thus, if we start a chemical reaction like combustion, which gives off heat, it appears from nothing; and, if we expand a volume of heat, gas or steam behind a piston and make it do work, part of the heat present disappears, at least it is gone as far as that immediate volume is concerned. Heat comes and goes without any change in weight or mass of the space or object.

We are thus forced to recognize heat as only one form of something more important. This we call energy. It is energy which we cannot create or destroy. It takes many widely different shapes and forms, but all are energy, and it is possible to convert from one form into another by suitable processes or cycles.

The natural inclination is for all forms of energy to degenerate into heat. Thus the kinetic energy in a bullet converts into heat when stopped. This is due to friction and impact so that the air, target and bullet are all raised in temperature due to the energy transformation and appearance of heat. All mechanical energy, if allowed to, that is not locked up in potential form, becomes heat, as it is released, due to friction. The same quantity exists and the heat or thermal energy in Btu is equivalent to the original energy.

The energy transformations we see all around us are manifestations of energy on its way to its final destination, as far as our earth is concerned, in the form of heat, Btu, at the atmospheric and earth temperatures. This is the sea level into which all energy eventually dumps, passing through many different forms en route.

High grade forms of energy are those forms from which, by process, we can convert to desirable forms, such as work, moving a force through a distance, electricity, velocity of a mass and other useful forms, all in general to do work or overcome a friction.

Energy is the antithesis of friction, the opposite or opponent of stationary or inert things. Friction is the medium through which high-grade energy is degraded to low-grade energy.

Energy cannot be created or destroyed. It is nature's blessing to mankind. It comes to us from the sun in the form of radiation, a very high-grade form of energy. It is stored on earth in the vegetation and fuels which result therefrom. Tides, winds and other forms result from celestial forces. Most of the sun's energy is converted at once to low-grade earth's-temperature heat, which in turn is radiated off into space at a still lower temperature, but without loss or change in total Btu heat content.

The high-grade energy stored up is released by combustion and appears as high-grade heat, high-temperature heat. Conversion of this heat into work or overcoming friction is the realm of engineering and thermodynamics.

The temperature of the heat energy, thermal energy may be considered as the grade of it relatively. The higher the grade, the more of it can be converted into useful work. When the heat is degraded to room or earth's temperature, it is no longer useful for conversion to work; it has forever lost its usefulness or work availability. Thus the term availability is used to indicate the degree of usefulness or gradation of the thermal energy. A decrease in availability means a reduction in temperature, or in the expansion of steam; it means a change of state from steam to water.

An example of high-grade energy is the hot gas. This may be a flame of combustion gases at atmospheric pressure. To use the available portion, it is necessary to transfer this heat at high temperature to another gas at high pressure so that it can develop a mechanical force. As the expansion proceeds, its pressure and temperature are lowered, and some of its heat content disappears as heat and reappears as an equivalent amount of mechanical energy—force through distance. This mechanical energy is immediately converted into heat again as it overcomes the friction load assigned, be it driving a ship or sawing wood. If it lifts a weight, the energy equivalent is stored in the potential form until such time as the weight is again lowered, when it appears as heat from friction.

Temperature and Appearance of Hot Gas

Appearance or color	*Temperature Degrees Fahrenheit*
Just visible in the dark	750
Dark red	975
Dull red	1290
Dull cherry red	1470
Full cherry red	1650
Clear cherry red	1830
Deep orange	2010
White	2370
Bright white	2550
Dazzling white	2730

If the hot gas has both temperature and pressure, as when liquid fuel is burned in a confined space, it can do work at once, as in the internal combustion engine.

Gas at atmospheric temperature, but at high pressure may be made to do work in an engine, but the temperature of the exhaust is so cold as to freeze up the engine in some cases. The appearance of work from expansion must be accompanied by a fall of temperature with the drop of pressure, as otherwise the work cannot be obtained.

Conversely, work — moving force through distance—can be made to compress a gas, increasing its pressure, and heat appears in the gas as evidenced by a rise in temperature. This heat did not exist before as heat but as energy. This heat can be drained off by transferring through the walls of the vessel under pressure to atmospheric temperature. The gas is now cool and at a pressure. It may then be expanded and the exhaust will be very cold, much below atmospheric temperature. This is the refrigeration process. The expansion may be made to do some work as in the dense-air ice machine where the cool compressed air is expanded in an engine. Or it may be expanded through a valve, as in the ordinary ammonia system. A great deal more reduction in temperature may be had if expanded in the engine than if through a valve, but the added mechanical complication is not usually warranted.

In this discussion we have covered the principles of thermodynamics which are stated in the so-called first, second and third laws as formulated by Sir Isaac Newton.

Heat Transfer

Heat as heat can be transferred only in one direction, down the temperature hill, from a hot body to a cooler body —never from a cool to hot body. Like water, it naturally seeks a lower temperature level. The greater the difference in the temperature level the faster it can be transferred, and the more of it is available to be transformed into useful work.

There is no way to transfer heat as heat except to lower its temperature in the transfer. Two bodies at the same temperature are in thermal equilibrium with no heat transfer.

Two bodies at unequal temperatures in contact with each other will, in time, equalize their temperature by a heat transfer.

In a heat transfer from a hot body to a cool body, the same number of Btu that leaves the hot body will be found in the cool body, but at a lower temperature. Thus, if we mix two volumes of water, one hot and one cold, but with a given total Btu heat content, the mixture will be at an intermediate temperature, but the total heat content in Btu will be unchanged.

Heat as heat can be transferred down the temperature hill in one or more of three different ways, conduction, convection and radiation.

If thermal contact exists, heat flows from one body to the other like water from one tank to another, by conduction. It moves by conduction through a conductor with a fall in temperature over each inch of distance. Heat flows through the walls of the tube containing water by conduction and raises its temperature.

Heat may be transferred from one body to another by first being transferred to one or more intermediate bodies. In the stone age, men heated the pool of cold water from the fire by first heating stones, then carrying them from the fire to the water. This is heat transfer by convection. Air heated from a fire or hot body then directed over a cold body transfers the heat by convection.

The most important heat transfer is radiation. All bodies contain heat in proportion to their temperature. All surfaces radiate heat out into space at a rate proportional to the fourth power of their absolute temperature.*

Radiation also is affected by the nature of the surface. A bright mirror-like surface radiates little, practically no heat. It also absorbs little or no radiant heat. A dull black surface radiates heat readily and absorbs it readily. Thus, we stop radiant heat loss from our boilers by painting with a bright aluminum paint.

An interesting experiment is to blacken a few square inches of the bright aluminum-painted surface of the boiler or furnace casing with lampblack and feel the very great increase of radiant heat from this blackened surface. This will be evidenced by sensing radiation on face or back of the hand. There is a good reason for the polished or nickel-plated condition of pots, pans and kettles in the kitchen.

Also, to test heat absorbing qualities, hang a thermometer where it may get radiant heat from a steam line or other black, hot body. Note the temperature, then blacken the bulb with lampblack and note the rise in temperature in otherwise identical conditions.

Heat transfer by conduction is proportional to the difference in temperature between the two ends of the heat path, such as the fire and water side of the water tube boiler. Also it is proportional to the area available for transfer and inversely proportional to the length of the path. A fourth factor is the nature of the material of the conductor. Metals are considered good conductors in general. Nearly all other substances are poor conductors.

For conduction then the transfer is: Btu equals temperature difference X area square feet X time in hours X constant K, all divided by length of path in inches. The constant K indicates the relative ability of a material to conduct heat. In general, metals which are the better conductors of

(Page 75, please)

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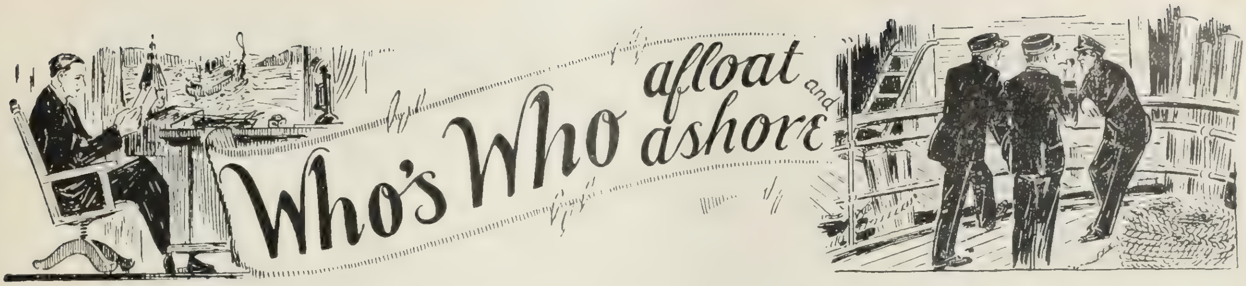
*Absolute temperature is the temperature in degrees as measured above the absolute zero of temperature at which no heat exists. On the Fahrenheit scale, the absolute zero is 460° below the scale zero. Thus, by adding 460° to the Fahrenheit temperature, we get the absolute Fahrenheit temperature.



Who's Who afloat and ashore

Edited by Jerry E. Scanlon

New Grace Executive

The appointment of R. Ranney Adams as executive vice president and member of the board of directors of Grace Line, succeeding the late Daulton Mann, announced by D. Stewart Iglehart, was enthusiastically received by the entire personnel of the company.

While Mr. Adams is not as well known on the West Coast as his predecessor who was born, reared and brought up in the steamship business in San Francisco, scores of friends and acquaintances know Grace Line's new chief and are warm in their praise of his refreshing personality, his rugged honesty in business dealings and ability as an all-around steamship man.

Mr. Adams has made only one trip to the Pacific range while with the Grace interests, but it is expected that he will make a visit here and inspect the offices and terminals in company with Fred L. Doelker, vice president in San Francisco.

Graduated from the United States Naval Academy at Annapolis in 1915, where he was honor man and president of his class, Mr. Adams went to sea aboard the battleships Michigan and Pennsylvania for eighteen months. Then his superiors in appreciation of his ability selected him for a post-graduate course at the Massachusetts Institute of Technology in naval architecture. Later he was assigned to the construction corps of the U. S. Navy with the rank of lieutenant.

During World War No. 1, Mr. Adams was stationed at the Brooklyn Navy Yard as superintendent of shops. He resigned from the Navy in 1919 to accept the position of superintendent engineer of the Foreign Transport and Mercantile Corporation of New York.

Then in 1928 he again went into service for the Government to handle the difficult job as organizer and director of the construction loan activities of the United States Shipping Board under authority of the Merchant Marine Act of 1928.

A year later Mr. Adams came to the Grace Line as vice president in charge of operations, a position he maintained until his present promotion. It was during this long and aggressive period that Mr. Adams' knack of getting tasks accomplished with seemingly little effort but with highly satisfactory results coupled with his rare judgment and keen foresight to further the best interests of this pioneer American steamship concern won the attention and admiration of his superiors.

Despite the multitudinous duties of Mr. Adams, he is a director of the Merchant Marine Institute, a trustee of the Webb Institute of Naval Architecture, a member of the Board of Governors of Seamen's House, the Society of Naval Architects and Marine Engineers, the Society of Naval Engineers, the Army and Navy Club of Washington and the famed India House.

His many friends here on the Pacific Coast wish Mr. Adams in his new berth "All Well and Pleasant Sailing!"

WELCOME BACK

Jerry Scanlon, young veteran of San Francisco marine reporters, returns to the pages of Pacific Marine Review!

Mr. Scanlon, by reason of his years of public relations work with leading Coast steamship lines, has countless friends in shipboard and shoreside circles and each month will present in these pages news stories and personal sketches of you and your friends.

Follow Jerry Scanlon in PMR!

R. Ranney Adams,
new executive vice president
and director, Grace Line

CAPT. TIERNEY

When the C-1 Cape San Martin, formerly in Grace Line's Pacific Coast-Latin American service, was shifted to the east coast, Captain Raymond J. Tierney, one of the veterans of the company in point of service, elected to remain with the vessel.

Chief Engineer William C. Angus who was on the vessel ever since she was launched and stood by while her propulsion machinery was being installed, stayed aboard to New York and then returned to San Francisco. He is now on vacation and will be assigned another ship.

* * *

STAG HOUND

When the steamer Stag Hound was taken by the Government, Chief Engineer Carl M. Thorson remained with the vessel as a supervising engineer. He has the option of remaining with the craft while it is in U. S. service.

* * *

CAPT. LUSTIE

Hundreds of friends and acquaintances of **Captain Alvin O. Lustie** will be pleased to learn that he is now assistant captain of the Puget Sound Navy Yard. It is recalled Captain Lustie first came to the Pacific Coast in 1921 when he brought the then crack liner H. F. Alexander around from New York to again enter the coastwise trade for the old Admiral Line after the vessel had served as a troopship during the war.

PHILIP B. IGLEHART, *son of* **D. STEWART IGLEHART,** *president of W. R. Grace & Co., has been named operating vice president of the Grace Line by* **R. RANNEY ADAMS,** *executive vice president. The appointment of Mr. Iglehart followed ten years of service with the company, working in all of the various departments, including several years' service on the piers in charge of wharf and ship operations*

Capt. Oliver Bergmann

HAWAIIAN PLANTER

Captain Oliver Bergmann is master of the new Matson freighter S. S. Hawaiian Planter. Captain Bergmann was born in Norway 56 years ago and came to this country when he was 23. He first entered Matson's service when he joined the crew of the Maui as an ordinary seaman during World War I.

Captain Bergmann served for years on various ships of the company, gradually working his way up as he received his grade licenses until 1928 when he was appointed master of the Wilhelmina. His last command before going on the bridge of the Hawaiian Planter was the Kohala out of Puget Sound to Hawaii.

Two of Captain Bergmann's sons are following their father's career, having joined Matson as able bodied seamen.

SAFETY PRIZE

Carl R. Bower, relief engineer for Matson Navigation Company at San Francisco, received a prize for inducing the installation of grab rails at the top of the steps leading to the mast tables on the company's trans-marine type vessels. These rails constitute an additional convenience and a safety factor for the men.

* * *

RECUPERATING

Lewis A. Lapham, son of Roger D. Lapham, chairman of the board, American-Hawaiian Steamship Company, and recently "in the sick bay," will be back at his desk as trade promotion manager of the company in another month.

Harold W. Squires, C. M. "Dad" LeCount, Edgar Jamison, Al Johnson, Fred Reimers

ELECTRIFYING FISH YARN

The reputation of the highly esteemed C. M. "Dad" LeCount, head of General Electric's marine activities in the Bay area, for truthfulness is vouched for by all, even his stiffest business competitor, W. Edgar "Eddie" Martin, Westinghouse's popular No. 1 man in San Francisco.

So with this introduction we will relate a fish story "Dad" LeCount told:

With Harold W. Squires, manager of the Industrial Department of the San Francisco Chamber of Commerce, Edgar Jamison, Al Johnson and Fred Reimers, "Dad" LeCount embarked on a trawler to a point in the Pacific abeam of Duxbury Reef. It was to be a salmon expedition and all the necessary piscatorial equipment for this species was aboard.

"Dad" was especially concerned to see that Mr. Jamison had a fine outing and caught plenty of salmon. In passing we beg to report Mr. Jamison in addition to being a Southern gentleman from Roanoke, Va., is also the father-in-law of "Dad's" son, Sam LeCount.

The party landed in fishing waters all right and they were biting, but instead of salmon being landed on spoons the party brought home twenty-five fine bass. Nary a salmon on the salmon spoons, related "Dad."

RAY JONES

R. C. "Ray" Jones, port engineer for the General Petroleum Corporation, has returned to his berth in Wilmington after a month's absence in Beaumont, Texas, where he handled the tanker fleet maintenance during the vacation of the regular port engineer.

* * *

ENSIGN NORTON

"Bob" Norton, Jr., son of Robert S. Norton, traffic manager for Sudden & Christenson, is wearing ensign's stripes and is attached to one of the Navy craft based in Puget Sound waters.

* * *

FULL AHEAD

Felix Reisenberg, Jr., who left his post as marine editor of a San Francisco daily to write a saga of San Francisco's waterfront and its people which has been hailed by critics as one of the best works of its kind, is now engaged on another writing adventure of the sea, "Full Ahead," with the intercoastal trade as its locale.

Reisenberg, whose late father authored some of the best of the sea yarns a quarter of a century ago, and who was an authority on marine engineering, is well qualified to handle his latest endeavor as he sailed on ships in the coast-to-coast trade before entering newspaper work.

CUISINE

James G. "Jim" Saeger, one of the most widely known among seafaring people and world travelers as a chief steward, is now head of the cuisine department on the Ruth Alexander. Prior to his present berth he was with Grace Line, running down to South America.

* * *

CYCLE TOUR

J. E. McLaughlin, rotund veteran purser of Grace Line ships, sometimes permits himself to indulge in food that is conducive to weight-building. However, Mr. McLaughlin is very careful to see that his avoirdupois does not get too far out of bounds.

During his last trip on the Santa Monica, Purser McLaughlin checked with his doctor. He was 25 pounds too heavy. So Mr. McLaughlin secured a bicycle and pedaled from Tacoma down the Columbia River Highway to San Francisco. He stayed over a day to see Marine Superintendent Edward Senter and then continued on down the El Camino Highway with Long Beach as his terminal, where he will rejoin the ship.

* * *

DAVID MILLER

Dave Miller, Lloyd's chief inspector on the Pacific Coast, was stricken suddenly and removed to a hospital for medical check-up at press time.

When the Government took over the APL's liner President Cleveland, Captain William Weaver was offered the opportunity of continuing as master but with Chief Officer J. D. Ryan decided to remain shore-side for a vacation. Both of these popular officers are to report shortly to receive appointments to other commands

TICKETS

The United States Bureau of Marine Inspection and Navigation at San Francisco announces licenses had been issued to the following as merchant marine deck and engineer officers:

Edward M. Brown, Antole M. Gordenev and Max O. Grant, masters, ocean; William M. Darragh, master, inland; George W. Peterson, Jr., and Lester M. Sieber, chief mate; Theodore William Baker, Harry M. Isnor, Kenneth Wayne, Robert Bellmer, Jerome K. Morgan and John A. W. Smith, second mates.

William B. Bellamy, Gerritt De Raad, Fred S. Erickson, Richard F. Murray, Rudolph A. Rutz, and Jack L. Welch, chief engineers; Samuel K. Allison, George W. L. Thomas, Thomas J. Tiernan, Jr., Dale C. Wigle, and Douglas W. Williams, first assistant engineers; George V. Patridge, Nikolaus Reese, Wilford H. Edmundson and Knud Edward Schmehl, second assistant engineers.

Fenton Harvey and Verne E. Hayes, third assistant engineers; and John J. Holland and Clement E. Taylor, chief engineers of motor craft.

HAWAIIAN PLANTER

Chief engineer of the Hawaiian Planter at press time was H. T. Berger. Other deck and engine room officers at this period were: Chief Officer William C. Canty; Second Officer Harold Rose; Third Officer Harold Davis; Fourth Officer Harold Diefendorf. First Assistant Engineer H. L. Engstrom; Second Assistant M. Gildersleeve; Third Assistant R. Gerdes; Fourth Assistant J. P. Brady. Licensed Junior J. G. O'Donnell and First Electrician A. Dornberger.

* * *

HAWAIIAN MERCHANT

Crack members of Matson Navigation Company's deck and engine room personnel are handling the operation of their two new freighters, the S. S. Hawaiian Shipper and S. S. Hawaiian Merchant.

The crew of the Hawaiian Merchant follows: Captain C. H. Morgan, Chief Officer William Aguilar, Second Officer Julius Zinn, Third Officer William S. Dodge, Fourth Officer K. S. Castle. Chief Engineer W. C. Dower, First Assistant A. Rettig, Second Assistant Peter Ebinger, Third Assistant Morris Nichols, Fourth Assistant George Cobb. Licensed Junior J. Schwab and First Electrician Frank Dickson.

* * *

HAWAIIAN SHIPPER

On the Hawaiian Shipper: Captain H. W. Heuer, Chief Officer E. W. Greenup, Second Officer William Liesen, Third Officer John Janus, Fourth Officer W. Redfield. Chief Engineer E. A. Oribin, First Assistant H. B. Moore, Second Assistant D. W. Billings, Third Assistant I. B. Simpson, Fourth Assistant R. G. Bloomfield, Licensed Junior Erwin Wells and First Electrician P. R. Muelle.

* * *

JOS. FITZGERALD

Joseph Fitzgerald, whose last sea job was chief engineer of the liner Santa Lucia and who resigned to join the United States Steamboat Hull Inspection Service, is still in Boston, word received from the former San Franciscan announced.

Marine "Information Please" Experts

The Port of San Francisco is generally credited in world shipping circles as having among other things the finest maritime information system of any port.

Few, however, know the long years and experience that is behind the Marine Exchange, and personalities who are responsible for this high record of efficient and courteous service.

Two of the top-ranking executives of the Marine Exchange are M. A. Cremer, manager, and Edward "Eddie" McCarthy, chief of the lookout station at Meiggs Wharf.

Manager Cremer, although he was born in Peoria, Illinois, had a hankering for the sea and early in life an urge to wander. He was graduated from Notre Dame University and then started to see the world.

He joined the U. S. Marines, and after the war was with the AEF in Coblenz, Germany. After the war he served on railroads, then went to South America as a trade commissioner under Secretary of Commerce Herbert Hoover. He is regarded as one of the best informed men on Latin America in this sector. He was secretary general of the First Pan American Reciprocal Trade Conference, which led to such splendid results between this country and the Spanish Americas. He instituted the trade development unit of the General Steamship Corporation. Two years ago "Mac," as he is known in shipping, assumed the managership of the Marine Exchange. Under his leadership many innovations to improve the service have been established.

Down at Meiggs Wharf, where a twenty-four-hour, seven-day-a-week lookout and launch service is maintained, "Eddie" McCarthy is without a peer when it comes to knowing every craft from all over the world visiting this port, as well as those smaller vessels that sail the bay waters.

Eddie McCarthy first took over the night watch at Meiggs Wharf for the Marine Exchange 35 years ago on July 1, of this year, and has been in charge of this post ever since 1915. The duty of the Meiggs Wharf station is to check the arrival and sailing as to running time, from and to what port and other factual matter for shipping companies, newspapers and varied interests. During the World War occurred the only break in Eddie's long service when he joined the Navy and was commissioned an ensign. His knowledge of ships and personnel was of invaluable aid to the U. S. Enemy Alien Inspection Detail that did such yeoman service along the 'Front.

Edward McCarthy, chief of the lookout station at Meiggs Wharf

M. A. Cremer,
Manager of San Francisco's famed Marine Exchange

Joseph M. Bell, third assistant engineer on the Lurline, is rapidly gaining fame as a builder of miniature ships in his leisure moments. However, the handicraft of Engineer Bell is different than most seafarers who model ships. Those from the skilled knife of Bell are made to incorporate a radio, with the small dial in the ship's hull looking not unlike a plimsol mark. Here is Mr. Bell working a square-rigged four-master which will carry sails of shim metal .005" thick which serve as the antenna. The masts were turned out on a lathe and the rail is soldered. Bell modeled the teakwood hull with an ordinary pocket knife

TO IMPORTANT POST

Once again Captain Henry M. Gleason has been recalled by the Government for National Defense duties. The popular and highly efficient executive left his post as operating and consultant manager for American-Hawaiian to head the materials and supplies division for the U. S. Twelfth Naval District under Admiral Greenslade. His close personal contacts with the leaders of Bay area shipyards coupled with his wide experience both as a naval and merchant marine executive placed him in an enviable position in behalf of his country.

It is remembered Captain Gleason was in charge of the Mare Island Navy Yard when the all-time world's record of building a destroyer, the Ward, in 17 days directed the attention of a war-embattled world to this feat in 1917. Captain Gleason after the war served for several years with the old Pacific Mail Steamship Company.

* * *

SEA TRAINING

F. C. Farrar, who is in charge of enrollment of youths in the recently established headquarters of the Maritime Commission to enlist apprentice seamen to man the vessels of the "Liberty Fleet" and other types building for the United States merchant marine, states that from all sections of the Pacific Coast applications from youths between the ages of 18 and 25 years are being received.

The offices in the United States Customs Building, San Francisco, are the headquarters where the applicants are received. Accepted applicants receive $21 per month, clothing, living accommodations and transportation to and from the Hoffman Island (New York) training station. The course covers a seven-month period.

* * *

CAPT. TARPEY

Captain M. F. "Mike" Tarpey, San Francisco Bar Pilot and one of the best known skippers on the Pacific, has been unable to perform his sea duties because of a broken ankle suffered in line of duty. While the injured member is mending Captain Tarpey is shoreside in the pilot offices at Pier 7, as office manager.

Capt. Henry M. Gleason

* * *

FRED DOELKER

Fred L. Doelker, vice president Grace Line in San Francisco, is expected to return from Washington the first of August. He has been endeavoring to secure replacement tonnage for the vessels taken by the Government for defense service. The ships taken over include the Flying Cloud, Red Jacket and the Cape San Martin, the latter being taken for service out of New York by Grace. The other two are handling transportation of supplies to recently acquired sea bases.

* * *

NEIL LOGUE

At the time of going to press Neil Logue, chief engineer of the tug Dauntless in Puget Sound waters, was recovering in the Marine Hospital, Seattle, from an infected thumb. His doctors ordered him hospitalized when the digit gave signs of developing infection.

APL VISITOR

Harry T. Reinold, New York City passenger agent for the American President Lines, has returned to his post after visiting San Francisco on his first trip. He conferred with **Hugh McKenzie,** vice president in charge of passenger travel, and **Walter Johnstone,** general passenger manager, while on the Pacific Coast.

* * *

VETERAN PASSES

The death in New York of **Henry Grothman,** old-time engineer on the Pacific Coast, was a shock to hundreds of his San Francisco friends of the marine engineering world. Until two months before his passing he was sailing out of New York on tankers as chief engineer. He was a brother-in-law of William "Billy" Russell, who is now serving as guarantee and supervising engineer for the United States Maritime Commission at the Union plant of Bethlehem.

* * *

CAPT. MORITZ

Captain Charles T. Moritz, Grace Line skipper, remained as master of the vessel when the ship, which was under charter was returned to the owners for rechartering to the Government.

COORDINATOR

The name of Roger D. Lapham, chairman of the board of the American-Hawaiian Steamship Company, was being furthered in Washington as the head of a proposed board to coordinate all forms of transportation—rail, water and truck for the duration of the national emergency.

* * *

CHAMP CURTIS

Austin Curtis, former chief officer of the freighter Waipio, has resigned and is now master of the tugboat at Kahului which guides ships in and about the harbor. During his period with the old Dollar Line transpacific, Curtis was regarded as the best boxer sailing out of the port of San Francisco and during the World War was middleweight champion boxer in the Army.

* * *

ACADEMY

Preliminary sketches for the new California Maritime Academy to be erected at Morrow Cove, near Carquinez Bridge, are being studied for final redrafting approval.

* * *

CHIEF ANDREW

The C-2 Flying Cloud, another Grace Line new ship taken for National Defense, is in command of the same officers with the exception of Chief Engineer Mitchell Andrew who transferred to the freighter West Celeron which is assigned to Grace. Moving into Andrew's berth as head of the engine room was Edward J. Graff who moved up from First Assistant. Second Assistant Samuel Kaehalio and Alexander Louis McGilvray each stepped up.

In command of the ship is Captain A. E. Nauman who was her regular skipper; Chief Officer is Robert Fulton Fox and Clyde W. Collins is second officer. All are U. S. Naval Reserve.

* * *

DELEGATE

Frank Leahy, United States Steamboat Traveling Inspector, whose headquarters are now in New Orleans, will come to San Francisco in October as delegate to the national convention of the Propeller Club of the United States.

Leahy was stationed in San Francisco about two years before being assigned and promoted to the Gulf post. He is a native of San Francisco.

New Pilot Commissioner

Friends from Nome and along the entire Pacific Coast as well as shipmates on the seven seas were gratified by the appointment of Lieutenant-Commander Francis Rawle Shoemaker USNR, as the new member of the State Board of Pilot Commissioners at San Francisco. The appointment was made by Governor Olson.

A commissioned officer in the U. S. Coast Guard for seven years, Commander Shoemaker has had sea experience on practically every type of Naval and Coast Guard vessel from a cutter to a battleship. While on the cutter Bear he made four Arctic cruises from 1903 to 1906. He was also on the Thetis during this period. Commander Shoemaker also was navigator of the famed Bear, as well as on the U. S. cruiser Detroit.

The new Pilot Commissioner had service as a lieutenant on the battleships California, Arkansas, and his total sea service covers twenty-seven years. During World War I, he served on submarines as lieutenant commander and commander.

Commander Shoemaker was born in Fort Union, N. M., but has been a resident of San Francisco since 1905. For the past 16 years he has been associated with the insurance brokerage firm of French & St. Clair. His appointment followed expiration of the term of James Rolph III, son of the late Governor Rolph.

The many friends afloat and ashore of **ALLAN McCULLOCH** *will be pleased to learn that he took unto himself a bride recently in Reno, Nevada. The bride is the former Mary Gallagher, member of a pioneer San Francisco family. The couple met while they were en route to New York. The groom was for many years first assistant and chief engineer on Richfield tankers and also on Grace Line vessels. He is the son of the late Allan McCulloch, a charter member and one of the founders of the Marine Engineers Beneficial Association, and a brother of the late John McCulloch, who also sailed as engineer out of this port. The newlyweds have built a new home in the West Portal district and Mr. McCulloch is now connected with the engineering department of the Western Pipe & Steel Company's South San Francisco shipbuilding yards*

Shipbuilding and National Defense

by Dr. Henry F. Grady

President, American President Lines

As we go to press Dr. Henry F. Grady has just returned from Washington, where he discussed with President Roosevelt and members of the Cabinet, the new assignment for which the President of the American President Lines has been chosen . . . that of appraising the entire raw material situation of the Philippines, Dutch East Indies, Straits Settlements.

During his stay in the Philippines, for which he will embark on August 12th by Clipper, Dr. Grady will analyze the effect of the export control system on the economy of the islands. He will also check into the situation of his own company, where it has trade outposts. The complete trip will take about two and a half months.

America's current shipbuilding effort, on the basis of cost of tonnage already projected, is more than twice as great as any ever attempted in the experience of this or any other country. According to latest available figures, our shipbuilding today is in excess of 12 billions of dollars. Of this amount 75 per cent or approximately 9 billions is for the account of the Navy, to provide this country the protection of a two-ocean fleet, and 25 per cent or 3 billions is for the account of the Merchant Marine.

A comparative idea of the enormous step-up in our shipbuilding industry as a result of National Defense is furnished in the fact that in normal times ship construction in the United States for both the Navy and Merchant Marine had an annual value of less than one hundred million dollars, or roughly eight-tenths of one per cent of what is currently programmed.

On July first of this year, according to the American Bureau of Shipping, there were 893 merchant vessels of approximately 6,000,000 gross tons under construction or contracted for in yards on the Atlantic, Gulf and Pacific Coasts. Recently President Roosevelt announced plans for doubling the number of ships on emergency order and asked Congress for supplemental appropriations of $3,323,000,000 for additional Naval and merchant ship construction. Following this, the Maritime Commission revealed plans to expand the present shipbuilding program by 566 cargo vessels, which is expected to step-up the tempo of production to *two ships a day* by November, 1942, when it is estimated the construction peak will be reached.

If no other ships are projected in the meantime, the present building program, including vessels already delivered, will bring our total merchant production for the three years ending December, 1943, to approximately 14,000,000 deadweight tons for a total cost in excess of three billions of dollars.

So much for the physical aspects of our shipbuilding program. The question then arises, why are so many ships necessary in this wartime emergency?

America's shipping program in National Defense consists of two major parts: First, the building of merchant ships in whatever quantity the emergency indicates, and second, the allocation of available vessels in such a way as to meet defense needs of this country and other countries fighting for democracy.

It has become axiomatic that "ships will win the war." Many experts agree that the turning point in this conflict will come when the rate of shipping tonnage destroyed by enemy action is equalized and then passed by production. In connection with shipping aid to Britain, losses have been occurring at the rate of close to five million tons a year. British merchant marine production before the war was around one and a half million tons a year. It is doubtful if this program has been increased under war conditions due to the vulnerability of English shipyards to enemy air attack. Thus it would appear that England must be provided with between three and a half and four million tons of shipping per year to break even under the present rate of losses.

In a recent speech, Admiral Land, Chairman of the Maritime Commission, had this to say about merchant shipping's place in National Defense: "It is not necessary for me to labor the point of our need for the largest, strongest and most powerful Navy which this country can produce. We are building merchant ships because they are really part of this first line of defense. *They don't even take second place!*"

In other words, merchant ships, under certain conditions, may be rated just as important as combat ships. Trying to draw a line of necessity between the Navy and the Merchant Marine is like trying to decide which is the more important to the human

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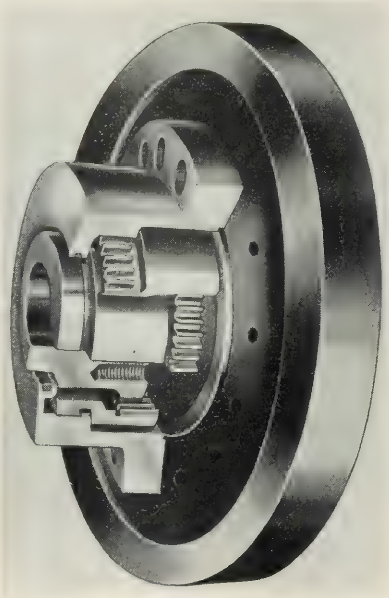
Keep Posted!

Recent Development in Ship, Yard and Dock Equipment

Manger Flexible Coupling Saves 50% Axial Space



The new Manger Flexible Coupling, made by Farrel-Birmingham Company, Inc., Buffalo, N. Y., provides complete flexibility between driving and driven machinery, yet requires a minimum of axial space between the two units. In fact, it requires only one-half as much axial space as the average flexible coupling.

As the cutaway view shows, the Manger Coupling consists of three simple, sturdy parts. Compensation for misalignment is made by an internal sleeve floating between an externally geared hub and an internally geared covering sleeve. The latter bolts directly to an engine flywheel, brake drum or flange and the geared hub is keyed to the driven shaft.

In appearance the Manger Coupling actually seems to be only a half coupling, yet it is in reality a complete flexible coupling which compensates for angular and parallel misalignment, as well as a combination of the two and at the same time permits free axial movement. It requires no dummy, pilot or stub shaft and is equally applicable for connecting two free-ended shafts in combination with a solid flanged half coupling.

When two units are coupled on both sides of a single driver it is possible to operate only one unit by unbolting the coupling and drawing back the outer sleeve on the driven shaft which is to remain idle. Since the hub on the driver is solid there are no loose parts to interfere with the free rotation of the driving shaft.

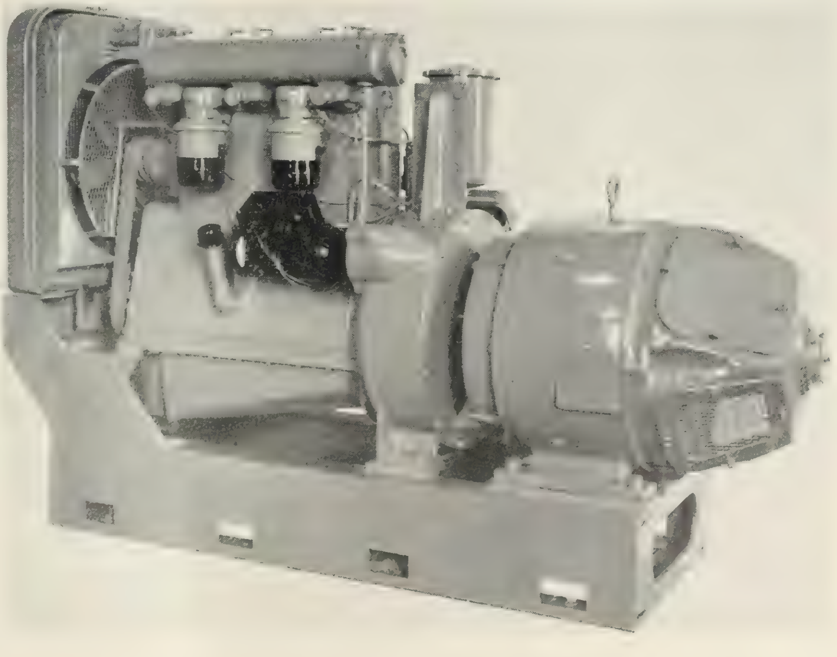
One of the many valuable applications of the Manger Coupling that is particularly interesting at this time in connection with National Defense production is the compact Hill Diesel generating set built for a U. S. Maritime Commission C-2 freighter and shown in the accompanying photograph. Many units of this type are being used as emergency power sources and are equipped to fit in as little space as possible. From the illustration, it is obvious that the Manger Coupling is enclosed in an engine flywheel housing, providing a most compact, close-coupled arrangement with full flexibility in three planes. Thus it is possible for the armature of a generator to find its normal operating position axially, and bearing wear from shaft misalignment is eliminated.

The simplicity of design which saves so much axial space also contributes to the durability and trouble-free operation of this coupling. There are only three parts and they are all of steel. Wear within the coupling is virtually non-existent and once installed the coupling requires no further attention except maintenance of the oil at the proper level.

◆

New Rubber Mountings

In addition to the complete line of natural cork and steel spring resilient mountings for reciprocating and rotating machinery, the Korfund Company, Inc., announces several new types of isolators employing rubber as a cushioning medium. These should be of particular interest to builders and users of small engines and relatively light-weight machinery.



Hill diesel generating set with Manger flexible couplings

Korfund Rubber-in-Shear. This safety mounting incorporates the same degree of design and isolation efficiency found in all Korfund anti-vibration products. Load capacities for individual units range from 25 pounds to 450 pounds. If necessary, two or more of these mountings may be combined in steel housings when greater load capacities are required.

Korfund Rubber-in-Compression. This compression type of mounting is very suitable for concentrated loads. A substantial saving in size and cost can be effected wherever the lesser deflection of rubber-in-compression is permissible. Both top and bottom steel sections are securely bonded to the circular rubber stock. Load capacities range up to 1200 pounds per mounting. If desired, this unit may also be used as a shear-mounting by bolting the base plate in a vertical direction.

Korfund rubber mountings are also available in extended structural integral bases. Thus, a common sub-base for driving and driven machinery can be provided with which perfect alignment between two machines can always be maintained. No other integral base is necessary and exact load distribution is achieved by correctly spacing the isolators within the steel members.

These new Korfund rubber isolators have been developed to meet an increased demand for scientific isolation of vibration and noise in the lower loading ranges. Although not quite as durable as steel springs, they are just as efficient when properly used and their economy will appeal to many users of relatively light-weight equipment.

* * *

Cellular Rubber For Marine Insulation

Cellular rubber, a new material which in spite of its extreme lightness is one of the best insulators known, will be introduced for the first time on the new all-metal yacht Revere, now under construction at New Bedford, Massachusetts.

The material is particularly adapted for marine insulation, since it is twice as light as cork. It was developed by engineers of the United States Rubber Company.

The name cellular is descriptive, since the material consists of a thin external dense layer enclosing microscopic cells of nitrogen gas in a matrix of rubber. Each cell in the structure is distinct from its neighbor.

A U. S. Navy life-saving jacket of cellular rubber

The insulation or "K" value (Btu per hour per degree Fahrenheit temperature difference for a specimen one foot square and one inch thick) of cellular rubber, which will be marketed under the trade name, U. S. Royal Insulation Board, is expressed as .237. This is lower than any of the 37 types listed in the U. S. Department of Agriculture Handbook, dated Nov. 2, 1939.

The figure compares with .30 for regranulated cork, .34 for gypsum in powdered form, .39 for laminated fibre board, and .59 for cellular gypsum dry.

Other specific properties claimed for the new rubber are: moisture resistance, rot proof, oil, acid and fire resistance, structural strength, long life, resistance to vermin and termites, and good workability.

Company engineers claim this combination of qualities is unique. Some materials have light weight, but lack structural strength and absorb moisture. Others are fire resistant, but too heavy and without insulation value.

Two weights of the insulation board are to be manufactured, only the lighter of which is to be fire resistant, The weights are: 4.5 pounds per cubic foot, and 5.5 per cubic foot for one-inch thick material. For lightness, this compares with 62.5 pounds per cubic foot for water, and 70 pounds for pure gum rubber stock. Unusual structural strength is combined with this lightness. The 4.5 weight will withstand 22 pounds per square inch without crushing, and the 5.5 weight, 35 pounds.

The boards can be cut to shape with a bandsaw or powersaw, and can even

(Page 110, please)

Applying cellular rubber board on inside of shell plating, Yacht Revere

General Electric Gets Largest Order

For Turbo-Electric Propulsion Sets

An approximately $16,000,000 order for National Defense, the largest single contract for merchant-marine ship equipment ever placed with one manufacturer, has been received by the General Electric Company from Sun Shipbuilding & Dry Dock Co.

Equipment to be supplied under the huge order includes main propulsion and auxiliary power-generating units, along with complete control and protective devices for 45 turbine-electric oil tankers to be laid down at the shipbuilder's Chester, Pa., yard under the U. S. Maritime Commission program.

At least six of General Electric's plants will participate in filling the order, with the major portion of the equipment being manufactured at Lynn (Mass.), Schenectady and Philadelphia.

The company's Lynn works will produce the propulsion and auxiliary turbine-generator sets and auxiliary motors; Schenectady will provide the main motors and propulsion control; and switchboards for the vessels will come from Philadelphia. In addition, the Pittsfield (Mass.) works will contribute power transformers; Fort Wayne (Ind.), generators, and Bloomfield (N. J.), control equipment.

The 45 oil tankers, which will each cost approximately $2,700,000 to build, are expected to be completed in two years. The keel of the first vessel was laid last month with completion scheduled for nine months later. The vessels will be of the single-screw type, each developing a maximum of 6600 horsepower at the shaft. In terms of kilowatts, the combined capacity of the propulsion and auxiliary turbine-generators for the 45 ships is equal to that of a power-generating station large enough to supply all the electricity normally used by almost 900,000 homes. The main propulsion equipment represents a combined capacity of 243,000 kilowatts, and the auxiliary equipment another 47,000 kilowatts.

Propulsion Equipment

For Three More Electric Tankers

Propulsion equipment for three more sister ships to the S. S. W. C. Yeager, launched by the Atlantic Refining Company at Chester, Pa., on July 7 is being manufactured by the General Electric Company. The W. C. Yeager is the sixth in the fleet of all-welded, turbine electrically propelled vessels.

The propulsion equipment consists of a turbine-generator which supplies power for a 5000-shp, 90-rpm synchronous motor. The turbine uses 600 lb, 900° F. steam, the highest pressure and temperature employed today for marine propulsion in this country. Generator and motor are connected through conventional control equipment.

Cargo oil-pumping equipment may be operated either from the main propulsion generator or from two 430-kw generators which also provide power for auxiliaries in lighting.

The nine vessels, all G-E equipped, will be duplicates in all essentials. They measure 520 by 70 by 40 feet and have a dead weight of about 18,000 tons. Displacement is 23,898 tons. Each ship will carry 154,000 barrels of crude oil at a speed of better than 13.25 knots.

The five vessels already commissioned are the E. H. Blum, J. W. Van Dyke, Robert H. Colley, E. J. Henry, and Robert C. Tuttle.

Your Problems Answered

by "The Chief"

(Continued from page 64)

electricity are also the best conductors of heat.

Some Interesting Conductivities

Material	Conductivity Constant K
Metals	
Aluminum	1475
Brass	770
Copper	2680
Gold	2070
Cast Iron	350
Steel	310
Mercury	58
Nickel	408
Silver	2850
Liquids	
Water	4.5
Lub. oil	1.16
Gases	
Air	.16
Carbon dioxide	.097
Hydrogen	1.13
Steam	.16
Solids	
Ice	15.0
Carbon soot	35.0
Chalk	5.8
Cotton	.5
Glass	6.0
Mica	4.0
Rubber	1.2
Wool	.25

Engineers' Licenses for June

Name and Grade	Class	Condition
SAN FRANCISCO		
W. B. Bellamy, Chief	SS, any GT	RG
G. De Raad, Chief	SS, any GT	RG
F. S. Erickson, Chief	SS, any GT	RG
R. F. Murray, Chief	SS, any GT	RG
R. A. Rutz, Chief	SS, any GT	RG
J. L. Welch, Chief	SS, any GT	RG
S. K. Allison, 1st Asst.	SS, any GT	RG
G. W. L. Thomas, 1st Asst.	SS, any GT	RG
T. J. Tiernan, Jr., 1st Asst.	SS, any GT	RG
D. C. Wigle, 1st Asst.	SS, any GT	RG
D. W. Williams, 1st Asst.	SS, any GT	RG
G. V. Pattridge, 2nd Asst.	SS, any GT	O
N. Reese, 2nd Asst.	SS, any GT	O
W. H. Edmundson, 2nd Asst.	SS, any GT	RG
K. E. Schmehl, 2nd Asst.	SS, any GT	RG
F. Harvey, 3d Asst.	SS, any GT	O
V. E. Hayes, 3d Asst.	SS, any GT	O
J. J. Holland, Chief	MS, any GT	O
C. E. Taylor, Chief	MS, any GT	O
JUNEAU		
C. V. Thompson, 2nd Asst.	SS, any GT	O
SAN PEDRO		
G. Lindsay, 1st Asst.	SS, any GT	RG
C. B. Hallet, 2nd Asst.	SS, any GT	O
J. E. Higman, 2nd Asst.	SS, any GT	O
D. J. Richards, 3d Asst.	SS, any GT	O

Abbreviations: SS is steamship, MS is motorship; GT is gross tonnage; O is original license; RG is raise of grade. All of these licenses are for ocean service.

On the Ways — SHIPS IN THE MAKING

LATEST NEWS FROM AMERICAN SHIPYARDS

Two Ships a Day from American Shipyards in 1942

Expansion of the merchant shipbuilding program in the United States to provide for the construction of 566 additional ships of more than 5,500,000 deadweight tons, at an estimated cost of $1,246,650,000, is authorized in legislation requested from Congress July 11 by President Roosevelt, in a communication addressed to the Speaker of the House of Representatives.

Details of this additional construction program were announced by the Maritime Commission, which has developed plans to the point where actual construction of facilities to build these ships could begin early this month.

All of the ships in this expansion are scheduled to be completed and in service by the end of 1943. The new program, combined with vessels already contracted for by the Commission, and those being built for other account, contemplates delivery into service of nearly 14,000,000 deadweight tons of merchant ships from United States shipyards, by that time. Vessels already under order by the Commission and others total approximately 8,160,000 deadweight tons.

The entire combined Maritime Commission program contemplates future construction of approximately 1200 vessels, of which 730 are of the emergency cargo type, known as the EC-2. In addition nearly 100 ships already have been built under the Commission's long-range program begun in 1938.

The ships to be constructed under this supplemental appropriation consist of 418 of the EC-2 type, totaling 4,389,000 deadweight tons; 24 C-3 cargo ships of standard Maritime Commission design; 42 C-2 cargo vessels; 18 C-1 cargo vessels; 39 of an adaptation of the C-2 type, which it is planned to construct in yards on the Great Lakes; and 25 ocean-going tugs of 150 to 200 gross tons.

Additional facilities for the construction of these 566 ships, the Commission announced, will be provided by building the contemplated shipways in already existing yards and reconditioned yards.

This new program, and that already under way, will bring the total estimated cost of ship construction under the national emergency to approximately $3,110,000,000. This total, however, does not take into consideration any appropriation asked or made for the requisition, purchase and repair of existing ships, either foreign or domestic, in connection with the National Defense emergency, or aid-to-the-democracies program, for which an authorization for $350,000,000 is made in the legislation asked.

Merchant ship production in the country, under the enlarged program, is estimated by the Commission as follows:

In the last half of 1941, 623,206 deadweight tons, made up of 444,206 tons under Maritime Commission contract, 158,800 under private contract, and 20,200 under direct contract by the British Government.

In 1942, when the peak of construction will be reached, the estimated production is 6,642,649 deadweight tons; of this 5,593,249 is tonnage under Maritime Commission contract, 463,600 under private contract, and 585,800 under direct British contract.

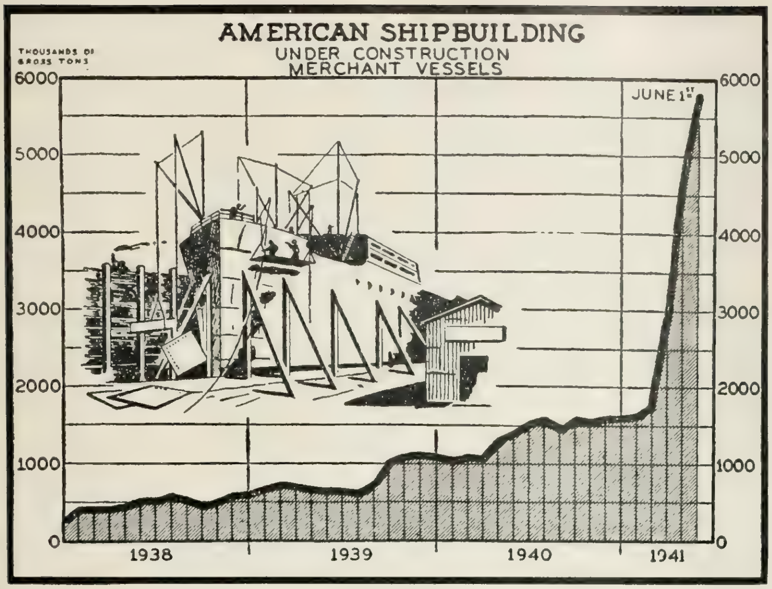
For the year 1943, the estimated production is 6,552,871 deadweight tons, of which 6,366,671 tons is for Maritime Commission contract, and 186,200 is for private account.

These estimates indicate that production in 1942 and 1943 will reach an average of approximately two ships a day.

In connection with this expanded program, the Maritime Commission announced that every effort is being made to speed up the training of workers to obtain an adequate number of skilled shipyard employees, as the peak of the construction program is reached.

Bethlehem Launches Tanker at Sparrows Point Yard

At 11:15 a.m. July 1, the S. S. Caddo, latest addition to the fleet of Socony-Vacuum Oil Company, slid down the ways at the Sparrows Point, Md., yard of Bethlehem Steel Company. Mrs. Arthur T. Roberts, of Bronxville, New York, whose husband is treasurer and



This statistical graph shows a vivid picture of the very rapid rise in value of American Shipbuilding contracts up to June 1. The rise during June and July continued on the same line due to the emergency request for 566 more ships. The graph was made by Merrill Lynch of E. A. Pierce and Cassat and is reproduced from the S. F. Chronicle

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a director of Socony-Vacuum Oil Company, was the sponsor. A sistership, the Corsicana, was launched on April 19. Four more tankers of the same design will be built for Socony-Vacuum at Sparrows Point.

Caddo's keel was laid on September 12, 1940. She has a deadweight of 16,000 tons and a tank capacity of 129,000 barrels, or 5,418,000 gallons of oil. Her cargo space is divided into 24 compartments, allowing many different grades of oil to be carried at one time. Pumping capacity is designed to load or unload the vessel in about 16 hours.

Principal dimensions are:

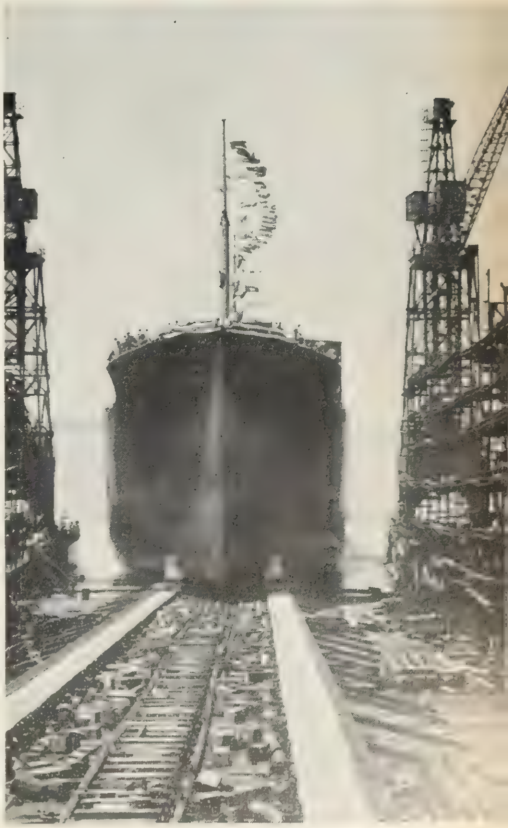
Length overall	501′4½″
Breadth molded	68′
Depth molded	37′
Draft loaded	29′8½″

The new tanker is a single-screw vessel equipped with steam turbines. Steam is supplied by two oil-fired water tube boilers.

Caddo represents the latest in tanker design. Extensive use of welding and application of the Bethlehem-Frear system of construction to longitudinals and bulkheads have produced a light, yet strong framing with a substantial increase in paying deadweight for the given displacement. The vessel is of the conventional tanker appearance with separate forecastle, midship navigation bridge, and poop, connected by the usual cat walk. Raked stem and cruiser stern give the vessel a pleasing, shipshape appearance.

She is built to the highest class of the American Bureau of Shipping, under their special survey, and in accordance with the regulations of the Bureau of Marine Inspection and Navigation. She complies with the highest requirements for carrying petroleum products.

Excellent accommodations are provided for 13 officers and a crew of 32 men. The men are housed two in each room, while the officers' rooms are arranged for single occupancy. Accommodations also include smoking rooms and mess rooms for officers and men, hospital, laundry, cold storage and provisions stowage.



Bids on Tugs and "Coasters"

The Maritime Commission opened bids July 15 on two types of harbor tugs and on one type of small, single-screw vessel known as a "coaster." The bids are shown in the table herewith.

Very interesting is the fact that five out of six Pacific Coast yards bidding on these jobs were lower than the Atlantic Coast and Great Lakes bids.

The "coaster" will be a small freight ship of about 2800 tons deadweight with a speed of approximately 10½ knots. It will be 258 feet 9 inches overall, beam of 42 feet 1 inch, and draft of 17 feet 11 inches. It will be coal-burning with reciprocating steam engines and single-screw propulsion. The dimensions of the "coaster" will permit it to pass through the Welland Canal.

One type of harbor tug will be powered by coal-burning compound steam reciprocating engines and will have approximately 1000 horsepower. With an overall length of 109 feet and beam of 27 feet, it will have a single screw.

The other harbor tug design provides for diesel-electric propulsion with one or two generators driving through a single screw. It will have an overall length of 105 feet and a beam of 25 feet. This design will vary from the customary tug design used in this country in that its towing bitts and towing machine will be located closer to midship than is the customary commercial practice. It is felt this will give increased maneuverability while handling a tow.

Single-Screw Cargo Vessels

Bidder	*No. of Ships*	*Fixed Price per Ship*	*Adjusted Price per Ship*
Savannah Shipyards, Inc.	9	$1,413,726	$1,263,726
Savannah, Georgia			
Yard at Savannah, Georgia			
Brunswick Marine Construction Corp.	1	1,636,000	1,576,000
Brunswick, Georgia	2	1,608,500	1,548,500
Yard at Brunswick, Georgia	3	1,596,000	1,536,000
	4	1,589,750	1,529,750
Lake Superior Shipbuilding Co.	1	....	1,546,000
Superior, Wisconsin	2	....	1,526,000
Yard at Superior, Wisconsin	3	....	1,516,000
	4	....	1,506,000
	5	....	1,496,000
	6	....	1,486,000
	7	....	1,476,000
	8	....	1,466,000
	9	....	1,456,000
Albina Engine and Machine Works, Inc.	9	1,385,500	1,185,500
Portland, Oregon			
Yard at Portland, Oregon			
Basalt Rock Co., Inc.	4	1,324,616	1,204,196
Napa, California			
Yard on Napa River south of Napa, California			
United Engineering Company, Ltd.	4	1,490,646	1,298,215
San Francisco, California	5	1,479,951	1,291,915
Yard at Alameda, California	6	1,470,613	1,283,795
	7	1,459,433	1,274,073
	8	1,450,929	1,266,765
	9	1,443,348	1,259,086

Single-Screw Tug Boats

Bidder	*Propulsion*	*No. of Ships*	*Fixed Price per Ship*	*Adjusted Price per Ship*
Sullivan Dry Dock and Repair Corp.	Steam	1	$444,750	$420,000
Brooklyn, New York	"	2	425,000	399,000
Yard at foot of 23rd Street	"	3	410,000	385,000
Brooklyn, N. Y.	Diesel	1	493,000	468,000
	"	2	460,000	435,000
	"	3	451,000	426,000
Birchfield Boiler, Inc.	Diesel	1	390,000	......
Tacoma, Wash.				
Yard at Tacoma, Wash.				
Southwest Welding and Mfg. Co.	Diesel	6	527,047	492,047
Alhambra, California				
Yard at Alhambra, California				
(This firm also submitted two alternate bids as follows):				
	Diesel	6	518,799	484,799
	(Single engine electric drive)			
	Diesel	6	469,700	440,700
	(Direct drive)			
Steel Construction Co.	Steam	1	414,000	387,000
Portland, Oregon	"	2	406,000	382,000
Yard at Portland, Oregon	"	3	398,000	375,000
	"	4	393,000	371,000
	"	5	390,000	368,000
	"	6	387,000	364,000

Emergency Shipbuilding Status

Five of nine new shipyards are now in productive operation with the laying of two more keels in the Maritime Commission's emergency ship program, laid Friday, July 18, at the Houston Shipbuilding Corporation, Houston, Texas, it was announced by the Commission July 21. The Oregon Shipbuilding Corp., Portland, Oregon, also laid two keels on July 18 and one on July 19. This makes a total of 25 keels laid for the 312 EC-2 type ships now under construction.

Out of 79 shipways being constructed at the nine different yards, 35 have been completed to date. The four yards which have not laid any keels will do

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so between now and September 1. It is estimated that the entire program is about sixty days ahead of schedule, and with the recent request to Congress by President Roosevelt for the authorization to build 566 more merchant ships, the entire program will be accelerated.

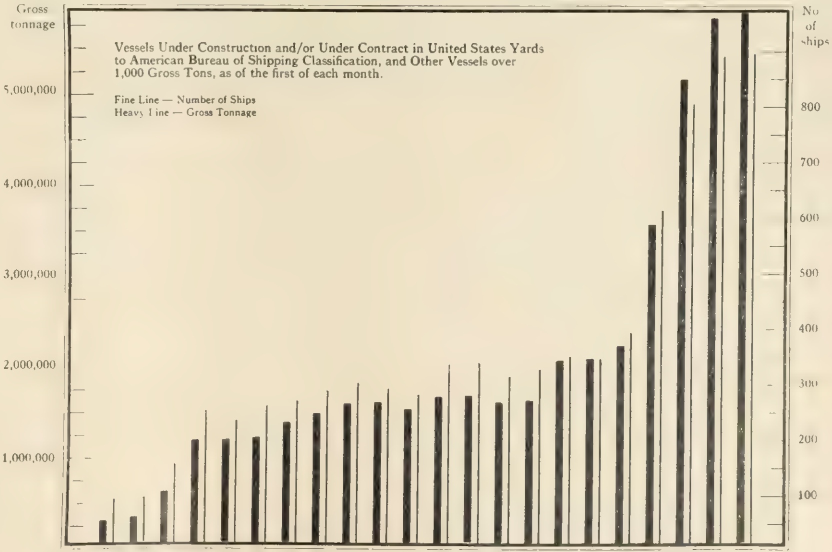
To date, the following shipyards have laid keels: Bethlehem-Fairfield Shipyard, Inc., Baltimore, Md., 6 keels; California Shipbuilding Corp., Los Angeles, Calif., 6 keels; Houston Shipbuilding Corp., Houston, Texas, 2 keels; North Carolina Shipbuilding Co., Wilmington, N. C., 3 keels; and Oregon Shipbuilding Corp., Portland, Ore., 8 keels.

Progress on Tanker Program

The keel of the first of the 72 tankers that the Maritime Commission is building at the Sun Shipbuilding and Drydock Co. plant at Chester, Pennsylvania, was laid July 15, exactly seven weeks after contracts for the $194,400,000 order were signed.

Laid on the first of the 12 additional building ways that the Sun yard found necessary to install to handle this largest single order yet placed with a shipyard by the Commission, Hull No. 316, as it is known on the Commission records, is scheduled to be launched on December 31, 1941 and delivered on February 28, 1942.

All 72 tankers, which aggregate 774,000 gross tons and which have a combined load capacity of 9,936,000



Number and gross tonnage in American yards
(Bulletin American Bureau of Shipbuilding)

MARINE DEPARTMENT
AETNA INSURANCE CO.
QUEEN INSURANCE CO.
MARITIME INSURANCE CO., LTD.
FIDELITY PHENIX FIRE INS. CO.
Commercial Hull Dept.
AUTOMOBILE INS. CO.

MATHEWS & LIVINGSTON
Marine Underwriters
200 BUSH STREET · · · · SAN FRANCISCO
Offices at: Colman Bldg., Seattle · 111 West 7th St., Los Angeles

EMERGENCY TYPE SHIPS

MCE Hull Nos.	Builder	No. Ea.	Gross Tonnage	Dead-weight Tonnage	Propul-sion	Bid	Contract Price per Ship
1-	Alabama DD & SB Co.	13	7,500	10,500	SR	C	$ 1,098,462*
13	Mobile, Ala.		Contract Price for Group -				14,280,000**
14-	Bethlehem-Fairfield SY Inc.	50	7,500	10,500	SR	C	1,281,320*
63	Baltimore, Md.		Contract Price for Group -				64,066,000**
301-	Bethlehem-Fairfield SY Inc.	12	7,500	10,500	SR	C	1,068,333*
312	Baltimore, Md.		Contract Price for Group -				12,820,000**
64-	California SB Corp.	31	7,500	10,500	SR	C	1,077,742*
94	Los Angeles, Calif.		Contract Price for Group -				33,410,000**
277-	California SB Corp.	24	7,500	10,500	SR	C	1,077,667*
300	Los Angeles, Calif.		Contract Price for Group -				25,840,000**
120-	Delta SB Co., Inc.	25	7,500	10,500	SR	C	1,070,000*
144	New Orleans, La.		Contract Price for Group -				26,750,000**
95-	Houston SB Corp.	25	7,500	10,500	SR	C	1,070,000*
119	Houston, Texas		Contract Price for Group -				26,750,000**
265-	Houston SB Corp.	12	7,500	10,500	SR	C	1,068,333*
276	Houston, Texas		Contract Price for Group -				12,820,000**
145-	North Carolina SB Co.	25	7,500	10,500	SR	C	1,070,000*
169	Wilmington, N C.		Contract Price for Group -				26,750,000**
217-	North Carolina SB Co.	12	7,500	10,500	SR	C	1,068,333*
228	Wilmington, N.C.		Contract Price for Group -				12,820,000**
170-	Oregon SB Corp.	31	7,500	10,500	SR	C	1,077,742*
200	Portland, Ore.		Contract Price for Group -				33,410,000**
229-	Oregon SB Corp.	12	7,500	10,500	SR	C	1,068,333*
240	Portland, Ore.		Contract Price for Group -				12,820,000**
241-	Richmond SB Corp.	24	7,500	10,500	SR	C	1,068,333*
264	Richmond, Calif.		Contract Price for Group -				25,640,000**
201-	South Portland SB Corp.	16	7,500	10,500	SR	C	1,078,750*
216	So. Portland, Me.		Contract Price for Group -				17,260,000**
	Grand Total Emergency	312	2,340,000	3,276,000			$345,436,000**
	Grand Total Standard	393	3,166,459	4,573,657			948,925,488
	GRAND TOTAL of MC Contracts to 7/15/41	705	5,506,459	7,849,657			$1,294,361,488

Notes: * This includes a base fee of $110,000 for each vessel completed, delivered and accepted in accordance with the provisions of the contract. Builder will be paid a bonus of $400 for each day ahead of contract date the ship may be delivered, or penalized $400 for each day behind contract date of delivery.

** This figure includes the $110,000 base fee per ship.

The totals for gross and deadweight tons do not include the 2 marine transports being built for the Navy.

[illegible] total contract prices are exclusive of contracts for Hulls Nos. 306-315, 199-222, and 388-393 Standard Types. (See notes pages 4 and 5)

- Steam-Reciprocating

[illegible] the Emergency type that will be registered under the American [illegible] be known as the "Liberty Fleet".

(The tabulation has no reference to the 566 additional merchant ships requested from the Congress by President Roosevelt on July 11, 1941.)

barrels, will be in service by the end of 1943. At least 25 will be delivered in 1942.

The second tanker keel will be laid at Chester, the middle of September, on the second new building way. Other keel layings on new ways will follow shortly after at regular intervals, Sun officials stated.

Each tanker at Chester is of 10,750 gross tons and has a capacity of 138,000 barrels. The contracts call for a vessel with a length of 503 feet, a beam of 69 feet, and a depth of 39 feet, three inches. Its engines will generate 6000 horsepower giving the hull a speed of 14½ knots.

In addition, the Commission has under construction in the longe-range program 11 other tankers on previous contracts. Six are being constructed by the Bethlehem Steel Co., Shipbuilding Division, Sparrows Point, Maryland, at a cost of $16,122,000. Two will be delivered in August and October of this year, the remainder in 1942.

The remaining five are under construction at the Sun plant at Chester. They will cost $13,101,500. The first one will be delivered in December, 1941, the others in 1942.

Summing up, the Commission's complete tanker construction program to date consists of 83 tankers of 894,000 gross tons and a capacity of 11,399,000 barrels.

Bethlehem Delivers Two

The SS Robin Sherwood, a C-2 cargo vessel of 10,000 deadweight tons (7100 gross tons) was delivered to the Seas Shipping Co., Inc., of New York City, by the Bethlehem Steel Co., Sparrows Point, Maryland, yard on July 16.

The SS Alcoa Pilgrim, a C-1 cargo vessel of 9398 deadweight tons (6762 gross tons) was delivered to the Alcoa Steamship Co., Inc., of New York City, by the Bethlehem Steel Co., San Francisco, California, yard on July 17.

Running LIGHTS

Who When Where

Coast Trade Meet

A general planning committee was selected in July for a Pacific Coast trade conference, to be held in San Francisco September 15 and 16, under the auspices of the Foreign Trade Association of the San Francisco Chamber of Commerce.

The committee, headed by Richard S. Turner, oil and tanker broker, includes: M. A. Cremer, manager, Marine Exchange; Commander K. H. Donovan, Moore-McMormack Lines, Inc.; E. S. Graham, A. Levy & J. Zentner Co.; W. L. Guthrie, Bank of America; P. A. Kinnoch, American Trust Company; E. Leuenberger, Wells Fargo Bank and Union Trust Co.; Ira S. Lillick, Lillick, Geary, Olson & Charles; Joseph F. Marias, president, Board of State Harbor Commissioners; E. J. Macfarlan, Standard Oil Company of California; L. I. McKim, General Steamship Corporation, Ltd.; Howard N. Middleton, secretary, Pacific Westbound Conference; Arthur B. Poole, American President Lines; Richard D. Quinlan, Jr., Parrott & Co.; A. S. Rupley, W. R. Grace & Co.; Harry S. Scott, General Steamship Corporation, Ltd., and Victor B. Smith, Sperry Flour Co.

This meeting is considered by its sponsors to be extremely important at this time due to the continual tightening of export and import restrictions.

Service Award

Alfred A. Fiore of the Moore-McCormack passenger liner Brazil has been presented with a service ribbon pin as the outstanding deck cadet of the Moore-McCormack Lines fleet during 1940. The presentation was made by Commander Robert C. Lee, executive vice president of the company, at its 5 Broadway offices, New York City.

Mr. Fiore was also awarded a service ribbon pin recently by the United States Maritime Commission for his high scholastic standing. On July 14 he will report to the Commission's cadet school at Fort Schuyler for a course in naval science and is then scheduled to spend a year ashore in its training course.

Lt. Comm. Francis Rawle Shoemaker, U. S. N. R., newly chosen member of State Board of Pilot Commissioners (Story on page 71)

After working forty-four years on California Street in San Francisco, W. T. Hunter goes into retirement as of July 1, 1941.

During that time he worked for the Erie Railway, C. & N. W. Railway, Luckenbach Line as freight agent for the intercoastal service, the Panama Pacific Line and Interocean Steamship Corporation. He joined the latter organization on July 1, 1930 as general freight agent covering European service. When he leaves them just 11 years later, he will receive a pension from the firm according to Erik Krag, executive vice president of the Interocean Steamship Corporation.

News of the Propeller Clubs of the United States

The Port of San Francisco

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First Vice-President

Arthur B. Poole
Second Vice-President

Hugh Gallagher
Third Vice-President

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Arthur B. Poole
Charles L. Wheeler

TO ALL PROPELLER CLUB MEMBERS:

Plans are now being completed for the great American Merchant Marine Conference and Fifteenth Annual Convention of the Propeller Club of the United States to be held in San Francisco, October 21-24, 1941.

From all indications, this will be the largest—and in view of the present conditions, the most important—gathering of men interested in the advancement of the American Merchant Marine to be held in many years. History repeats . . . and again the value of American ships for commerce and national defense is again being brought forcibly to the consciousness of the public. We are building a new American Merchant Marine, not only to meet the demands of the present, but to provide adequate shipping facilities for the future.

We urge all members of the Propeller Club to plan to be in San Francisco and to lend their support in our long range program furthering the American Merchant Marine for our economic and national defense.

Yours for American Shipping

T. A. Scott, *President*
The Propeller Club of the United States
J. L. Luckenbach, *Chairman*
American Merchant Marine Conference

Building the Convention

Good news about the special Propeller Club land-cruise train comes from out of National Headquarters. This official "caravan" makes it possible for Eastern visitors to leave their offices as late as Friday afternoon . . . delegates from the mid-West on Saturday . . . and arrive the following Monday evening in plenty of time for the first gun, which will be sounded on Tuesday morning.

The American Express Travel Service is handling the land-cruise, and arrangements will be made for brief stops en route.

F'rinstance:

First stop at Boone, Iowa, for a Western style barbecue dinner . . . then at Cheyenne for a Wyoming chuckwagon luncheon and show . . . next at Reno, "the biggest, etc.," for a sightseeing trip and luncheon at the Riverside Hotel.

Through Pullman car parties . . . from Coast to Coast, with something doing every minute — and we'd like to be aboard!

OFFICES FOR THE WORKERS!

Chairman Edward H. Harms tells us that official business headquarters will be ready for action on August first.

The offices will be maintained at the Fairmont Hotel, and committee chairmen will find all facilities for their convention assignments.

Over one thousand delegates, visitors and spouses are expected, and about six hundred of them are due to arrive in one fell swoop on that special land-cruise we were just talking about. That's where Joe Marias' committee will function long and efficiently. We hear plans are in the air for a reception at the good old Ferry Building!

The Fairmont, as you know, will be the setting of the five-day meet. More than one hundred exhibits of marine manufacturers' products will be on display.

To our Eastern friends—a word or two on that important subject:

"What to Wear in San Francisco."

To begin with, dress is more or less optional. You can be pretty safe in figuring the weather out here in the Bay district around convention time will be like Spring back your way.

No special clothing is required in California at any time of year—unless you intend to go into the high Sierra for snow sports.

Best rule to follow is to bring whatever you like to wear at home in Spring. Sports clothes are worn widely in California at all times. And while you may wish to dress formally on some evenings, you will find night life here delightfully informal.

However, be sure that your wardrobe contains a light topcoat or summer fur, for San Francisco's cool night temperatures call for these in every month.

Program

FIFTEENTH ANNUAL CONVENTION

HOTEL FAIRMONT, SAN FRANCISCO—OCTOBER 21-24

Monday, October 20

10:00 a.m. to 11:00 p.m.	Registration for members, Port of San Francisco, and other West Coast Ports.

Tuesday, October 21

8:00 a.m. to 8:00 p.m.	Registration
10:00 a.m.	Meetings of National Committees Credentials Committee Constitution and By-Laws Committee Overseas Propeller Clubs Committee Public Education Committee Nomination Committee Resolutions Committee Student Ports Committee
10:30 a.m.	National Board of Governors Meeting
10:30 a.m.	Sixth Annual Meeting of the Women's Organization for the American Merchant Marine, Inc. in conjunction with The Ladies' Committee of the Propeller Club, Port of San Francisco—*Fairmont Hotel*
12:30 p.m.	Annual Propeller Club Golf Tournament —*The Olympic Club at Lakeside*
5:30 p.m.	Cocktail Party tendered to delegates and visitors by the Propeller Club, Port of San Francisco—*St. Francis Yacht Club*
7:30 p.m.	Buffet Supper tendered by the Propeller Club, Port of San Francisco—*Fairmont Hotel*
9:15 p.m.	Aquatic Entertainment —*Terrace Plunge, Fairmont Hotel*
10:00 p.m.	Informal Reception, Dance and Get-together Party—*Fairmont Hotel*

Wednesday, October 22

8:00 a.m. to 6:00 p.m.	Registration
10:00 a.m.—	Opening Session, Propeller Club of the United States—*Gold Ball Room*
10:00 a.m.	Shopping Tour of Chinatown followed by Luncheon in Chinatown tendered to visiting ladies by the Ladies' Committee
5:30 p.m.	Cocktail Party, followed by President's Dinner tendered by the Propeller Club, Port of San Francisco —*Claremont Country Club, Oakland*
9:00 p.m.	President's Reception and Dance tendered by the Propeller Club, Port of San Francisco —*Claremont County Club, Oakland*

Thursday, October 23

8:00 a.m. to 6:00 p.m.	Registration
9:30 a.m.	First Session, American Merchant Marine Conference—*Gold Ball Room*
12:00 Noon	Luncheon tendered by the Propeller Club, Port of San Francisco, to the members of the American Merchant Marine Conference Committee and National Board of Governors of the Propeller Club of the United States —*Top of the Mark*
12:00 Noon	Luncheon tendered to visiting ladies by the Ladies' Committee at the Cliff House, followed by sightseeing auto tour of San Francisco
2:00 p.m.	Second Session, American Merchant Marine Conference—*Gold Ball Room*
6:30 p.m.	Reception in honor of Distinguished Guests and Conference Speakers
7:00 p.m.	Fifteenth Annual Banquet of the Propeller Club of the United States in conjunction with the American Merchant Marine Conference Committee and the Women's Organization for the American Merchant Marine —*Terrace Ball Room, Fairmont Hotel*
10:00 p.m.	Grand Ball

Friday, October 24

8:00 a.m. to 1:00 p.m.	Registration
9:00 a.m.	Second Session, Propeller Club of the United States—*Gold Ball Room*
11:00 a.m.	National Board of Governors' Meeting
1:00 p.m. to 4:00 p.m.	Harbor Sightseeing Trip and Buffet Luncheon

More About the Convention

AT THE COUNTRY CLUB

The President's Reception and Dance tendered by the Propeller Club, Port of San Francisco, to the American Merchant Marine Conference Committee, to the members of the Women's Organizations, and the delegates, members and ladies of The Propeller Club of the United States, will be held at the Claremont Country Club on Wednesday evening, October 22nd.

The Committee expressly desires that all visiting members and their ladies attend, in order to allow them the opportunity of extending a genuine welcome.

FOR THOSE WHO GOLF

The Annual Golf Tournament of The Propeller Club of the United States will be played on the splendid course of the Olympic Club on Tuesday afternoon, October 21st. Players will compete for the National Propeller Club Trophy, to be retained by the successful contestant until the 1942 Convention, as well as for many attractive prizes to be provided by the Golf Committee of the Propeller Club, Port of San Francisco. The member turning the lowest net score will be awarded the National Trophy. Adjustments of handicaps will be made, if necessary, after players have completed the first nine holes.

Transportation between the Hotel Fairmont and the Olympic Club will be provided. Luncheon will be served all golfers at the club preceding the tournament.

All members desiring to enter the tournament, or who desire to play golf at any other time while in San Francisco should register with the Golf Committee, Joseph A. Lunny, chairman.

TOP OF THE MARK

A luncheon will be tendered by the officers of the Propeller Club, Port of San Francisco, to the members of the American Merchant Marine Conference, Conference Speakers, and to the National Board of Governors of The Propeller Club of the United States on Thursday, October 23rd, at the "Top of the Mark."

IN THE TERRACE BALL ROOM

The Annual Banquet of the Fifteenth Convention of The Propeller Club of the United States will be held under the auspices of the Propeller Club, Port of San Francisco, in conjunction with the American Merchant Marine Conference Committee. The banquet will be held in the Terrace Ball Room of the Hotel Fairmont, Thursday, October 23rd.

A large Banquet and Entertainment Committee of the Propeller Club, Port of San Francisco, has been appointed and the Committee assures that this affair will be the finest and largest in Propeller Club history.

It is confidently expected that the Terrace Ball Room of the Hotel Fairmont will be sold to capacity. The San Francisco Convention Committee is exceedingly desirous that all out-of-town members, their ladies and guests, will be assured desirable locations. For this reason, it is suggested that reservations be made at an early date for the Banquet, together with check to cover, and be transmitted direct to the Chairman of the Banquet Committee, Capt. Lewis Mesherry, care Army & Navy Club, Hotel Fairmont.

FOR THE LADIES

The Ladies' Committee for the reception and entertainment of the visiting ladies is composed of members of the Women's Organization of the Propeller Club, Port of San Francisco, with Mrs. Charles L. Wheeler as chairman.

Joseph A. Lunny of McCormick Steamship Company, who will lead the Propeller delegates to the beautiful Lakeside golf course of San Francisco's Olympic Club on Tuesday, October 21st

Included in the entertainment will be a luncheon tendered in honor of the visiting ladies. Arrangements have been provided for golf for those desiring to play. Sightseeing and shopping trips have been arranged.

Headquarters of the Ladies' Committee will be in the Hotel Fairmont, where members of the Committee will be available at all times. A special section of the Registration Desk will be devoted to the ladies, with attendants on hand to furnish information concerning activities. All ladies are requested to register and receive the official convention badge and tickets for the various social events.

SPECIAL MEETING

At 10:30 a.m. Tuesday, October 21st there will be held in the Hotel Fairmont a joint meeting of the Women's Organization for the American Merchant Marine, Inc., of New York, Mrs. Benn Barber, President, and the Women's Organization of the Propeller Club, Port of San Francisco. This will be the Sixth Annual meeting of the Women's Organization for the American Merchant Marine, Inc.

The Port Captain of the

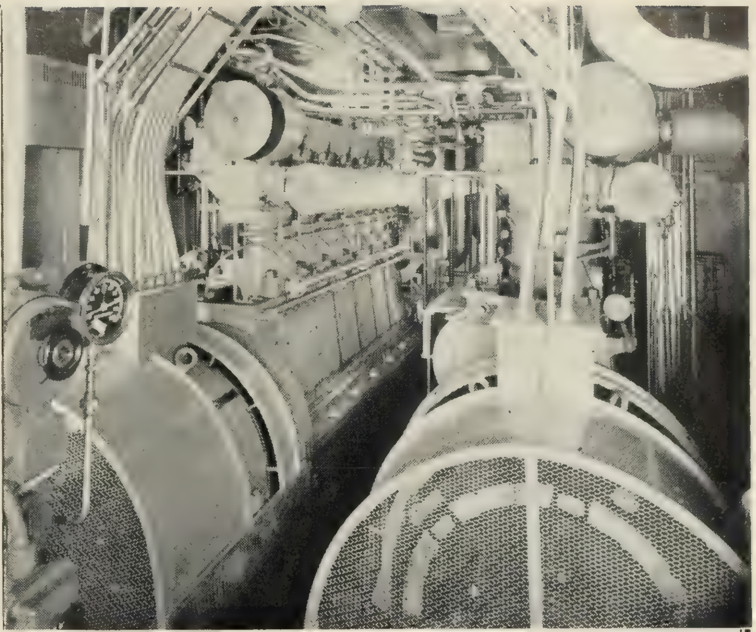
American Mail Line *says:*

"We are extremely well satisfied with the performance of the Washington Diesel generating sets on the 'Capa Alava,' 'Cape Flattery' and 'Cape Fairweather'."

All five of the C-1 type motor freighters ordered from the Seattle-Tacoma Shipbuilding Co. by the Maritime Commission for American Mail operation are equipped with two 275 K. W. Washington Diesel generators. Two of these boats have already crossed the Pacific, another is now on her way, so that this machinery has been given the severest of operating tests.

The performance of these generating sets is just one more testimonial to the reliability of

Washington Diesels



Washington Diesel Model 6-S-160 275 K. W. Generators on "Cape Flattery"

"you can always depend on a Washington"

WASHINGTON IRON WORKS

ESTABLISHED 1882

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Always!
Ingalls
SHIPBUILDING CORPORATION
SHIPYARDS: PASCAGOULA, MISS. · DECATUR, ALA.
OFFICES: BIRMINGHAM · NEW YORK · ATLANTA · NEW ORLEANS · PITTSBURGH

Dr. Grady on Shipbuilding

(Address before the Graduate School of Business, Stanford University, July 25, 1941.)

(Continued from page 72)

body, the heart or the lungs. The point is, neither can function without the other. Thus, while we must have battleships, cruisers and destroyers, we must also have auxiliaries and supply ships to service the combat units of the fleet. And neither of these services of combat and supply would be worth much without other ships, merchant cargo carriers, which must feed our furnaces and smelters and factories with the strategic and critical materials produced overseas.

Were the Merchant Marine to be seriously crippled by the taking of too many ships by the Army and Navy or by the lack of an adequate replacement program as a part of war production, the whole vital problem of producing war equipment would be in jeopardy.

What of the years after the armed conflict ceases? What will be our national maritime policy? I think it is incumbent upon us to plan now to meet certain inevitable post-war problems of our merchant shipping. Other nations now at war are already at work on their respective problems in this regard. Even Great Britain, harassed as she is by a life and death struggle, has had a special commission at work for months studying plans for restoration of her merchant shipping industry.

A properly conceived world order is one in which the interests of all the countries are on the side of peace and cooperation; that is, where all recognize the economic inter-dependence of the world and the stake that each country has in the well-being and prosperity of the world. The fact remains, however, that world trade has, especially in the years immediately preceding World War I and the period between that war and World War II, been carried on to a large degree in terms of economic warfare.

The period between the two wars was not one of peace but of armistice. Military hostilities were not engaged in, but economic hostilities were. Unless the basic character of economic factors receive prime consideration in the adjustment after this war, I fear we will have another armistice rather than a peace. One need not accept the doctrine of the complete economic determination of history to say that the causes of wars are largely economic and that unless a basis for economic peace can be found and generally accepted there will be no peace.

When the world is prepared to move definitely toward economic disarmament, then we can talk about reliance upon international delivery systems, but as long as there are factors of economic warfare, each country must maintain all its armament, including its Merchant Marine.

The vital importance, therefore, of shipbuilding as a war industry is apparent. It is essential during war and it is essential in the post-war period as a protective device against continued economic warfare by those who may have accepted a military armistice, but not an economic armistice.

It would be a great mistake, during the period of post-war readjustment, to abandon our shipyards as we did after the close of World War I. We must retain a well-planned long range policy on ship construction.

All of the present emergency shipbuilding facilities of course would not be needed in peace time, but since it is not certain that a peace will be established which will immediately bring about thoroughgoing international economic cooperation, it is extremely important that sufficient yards, strategically placed along our three coast lines, be maintained to meet all requirements of both Navy and Merchant Marine. We should be in a position at all times to carry a substantial portion of our foreign-borne commerce, because no other country with a merchant marine could be expected to give consideration to our trade if their ships were needed elsewhere in their own national interest. It is of supreme importance therefore that new, modern freight and passenger ships be constructed even during this period of concentration on war aims so that we may not be helpless to take care of our vital interests in the post-war years.

We set a noble example and invited the world to follow us in 1934 when we advocated the general reduction of trade barriers and I feel that it must be our responsibility in the coming post-war period to continue to set such an example. If we were to swing in the direction of isolationism, which is another way of saying in the direction of active economic warfare, there would be little hope for the world to find a peace basis. That responsibility is ours and we must not shirk it. The maintenance of our Merchant Marine under a construction subsidy basis and on an operating differential basis is not inconsistent with this view. We, I think, must be prepared to cooperate in disarmament, but no one can expect us to disarm commercially and economically until there is a general world program of disarmament.

Nothing is clearer than that matters of trade, of finance, of foreign exchange, price levels, of Merchant Marine have to be matters of international cooperation. A major price recession in this country affects the whole world. A British policy with regard to exchange rates or bank discount rate, which would have for its purpose the lowering or raising of the price level in that country, would have important repercussions in this country and in other countries. Economic and financial questions have become so much a matter of Government regulation and control that even the lowering of trade barriers is not enough. In fact, lowering of trade barriers without international cooperation in these other vital matters would not effect the purpose desired.

This type of cooperation is necessary in the development of the American Merchant Marine and we must, although prepared to cooperate fully, keep our Merchant Marine strong and prepared to protect our interests whether the international economic conflict be great or small.

(Concluded on page 96)

"MOORE *delivers* **MORMACSUN** *. . . . pictures and some comment on latest C-3 for Moore-McCormack Lines" is the theme of the attractive display appearing currently in the windows of Moore-McCormack offices at Pine and Battery streets in San Francisco*

We hail with delight this reproduction of **PACIFIC MARINE REVIEW'S** *July front cover and editorial features!*

Our photograph, flashed at night, presents these several pages from PMR with a colorful South American background

These well-planned Moore-McCormack window displays are always effective attention-arresters luring the traveler and shipper

(Continued from page 39)

continued, "that at one time we could only do business with companies offering free samples. Anyone who had five or six barrels of oil that they wanted us to use so that we could become acquainted with their product was manna from heaven. We owed Standard Oil so much that they were on the point of taking us over. I think the only thing that stopped them was that they didn't want a white elephant on their hands."

Air mail was new to Pacific Coast residents, and they were slow to take to the idea. Hall and the pilots themselves on their hours off would harangue publicly and in private on the advantages of the air over ground transportation. Chambers of Commerce were made to promise to airmail all their own letters and to start campaigns among business firms to do the same to support the infant industry.

"The help of these Chambers of Commerce did a lot toward saving the day for Pacific Air Transport," said Hall.

The airline soon discovered that it had to have additional passengers, as well as mail, to make a go of the business. An active campaign for this new type of revenue was started, and more care was taken of their comfort.

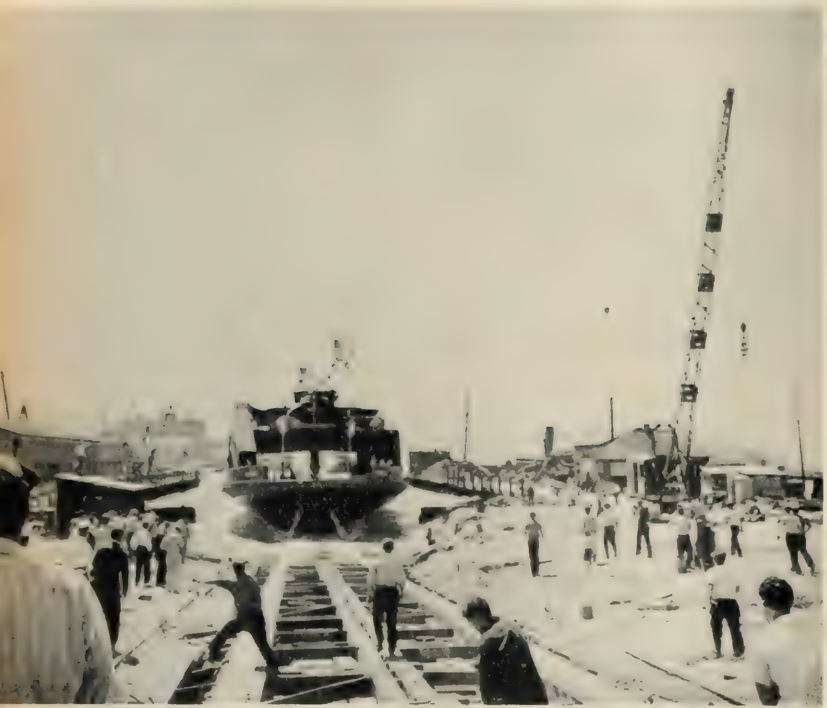
"Our best customer was 'Strangler' Ed Lewis, the wrestler," recalled Hall. "A giant of a man, he would purchase two seats for his huge frame after we inaugurated service with the Boeing 40-b-4s. He had to fill numerous wrestling engagements and the airplane allowed him to make one-night stands that would have been impossible by train. I think he was the first passenger ever to fly a million miles, and to us he was solid gold."

When Pacific Air Transport was first started there were no lighted beacons, no two-way radio, and the barest of local weather information. There weren't even adequate flood lights on the landing fields. Head lights from old Ford cars were stuck on top of sheds and hangars and the pilot just landed as best he could.

Railroad tracks were of almost as much benefit to the pilots as they were to the railroad engineer. When lost, a pilot would swoop near to the ground, attempt to locate a pair of rails and follow them to some destination where he could locate himself.

(Page 112, please)

Historic Yard Builds latest word in Diesel Vessels



A NEW DIESEL ENGINE FERRYBOAT. *This photograph shows the new ferryboat Hudson being launched at the famous old Donald McKay Shipyards in East Boston, Mass., where the renowned American Clipper ships were built nearly a century ago*

HISTORIC REPLICA. *This replica of the Glory of the Seas was made of highly polished wood, taken from the ways on which that famous ship was launched in 1869. The photograph shows* GEORGE W. CODRINGTON, *president of the Cleveland Diesel Engine Division of General Motors Sales Corporation, presenting the replica to* E. G. DIEFENBACH, *president of Electric Ferries, Inc., for whom the new Ferryboat Hudson was built*

GLORY OF THE SEAS—*the last American Clipper ship launched by Donald McKay in 1869 from the same yards where the Hudson was built. This pictures the scene at that launching*

Among the merrymakers at the supremely successful American Society of Tool Engineers, Los Angeles, annual banquet during June were these gentlemen from the California Shipbuilding Corporation: Left front to rear—1. Mr. Paul Grant; 2. Mrs. Paul Grant; 3. Mr. H. Frederich; 4. Mrs. H. Frederich. Right front to rear—1. Mr. J. A. Spruill; 2. Mrs. J. A. Spruill; 3. Mr. C. A. Hasenstab; 4. Miss Shy Clark

San Francisco's New Marine Museum Gains Momentum

The West's first Museum of Science and Industry, with headquarters in Aquatic Park, San Francisco, has launched a drive for members, following completion of its initial plans.

Housed in Aquatic Park since last June, the new museum has started with the nucleus of a marine exhibit, to which it is planned later to add land and air transportation, mining, agriculture and many other types of industrial and scientific exhibits.

The Museum of Science and Industry, which was incorporated last October, will have the following types of memberships: Donors, Fellows, Voting Life Members, Non-Voting Life Members, Non-Voting Foundation Members, Corporate or Company Members, Contributing Members and Sustaining Members, ranging from $1000 to $5. Membership and voluntary contributions will sustain all operating costs. The building is provided by the city of San Francisco.

Mrs. Alma Spreckels Awl is chairman of the new museum, with Walter J. Walsh as president; William A. Baxter, secretary, and Edward S. Clark, director. Trustees are H. D. Collier, Frank J. Edoff, J. D. Grant, Sidney M. Hauptman, Edward H. Heller, Al C. Joy, Jerome Landfield, Roger D. Lapham, F. M. McAuliffe, Felix S. McGinnis, Campbell McGregor, Joseph A. Moore, Jr., John N. Rosekrans, William P. Roth and Frank Rice Short. William E. Bond is managing director.

The museum is open daily, except Mondays, from 10 a.m. to 4 p.m. There is no admission charge.

Included among the miniature vessels on display are valuable and unique collectors' items illustrating marine history, past and present—old clipper ships, schooner yachts, pilot schooners, cargo steamers, passenger ships, derrick barges and battleships.

One of the most striking of the model ships is one of the Queen Mary. It is over 12 feet long, in perfect scale and is complete to the smallest deck fitting. Two of the models are of large sailing vessels under full sail. One is a model of the famous Cape Horn clipper, the Tillie E. Starbuck. Another is a model of the four-masted bark, Kenilworth, with figures of her crew working on the deck. The well-known American clipper ship, Flying Cloud, is represented by an outstanding model, showing the ship just dropping anchor with the crew furling sail, launching a boat and doing other work. There are original clipper ship bills of lading, the only copy of the first issue of the "Guide"—1865, old prints of early Pacific Mail liners and other rare documents and pictures.

The Museum maintains an office in the Merchants Exchange Building, 465 California St., telephone YUkon 1301.

SAN FRANCISCO MUSEUM OF
SCIENCE AND INDUSTRY
465 California Street
San Francisco, California

Pacific Marine Review

Dear Sirs:

I wish to thank you for sending the article regarding the Marine Museum which appeared in the PACIFIC MARINE REVIEW.

Since the Marine Museum moved to the Aquatic Park Center more than 10,000 people have viewed the exhibit. Also, since you viewed it here in the Merchants' Exchange Building, additional models have been added and expansion is now being planned by the Trustees.

The publicity which you have given the Museum is sincerely appreciated by the Board of Trustees and myself.

Yours very truly,
WILLIAM E. BOND,
Managing Director

New Offices in Los Angeles For Transpacific Line

In Los Angeles, Clarence F. Yenney, widely known in Southern California shipping circles for his years of service with the General Steamship Corporation, will be district manager of the newly established offices of the Transpacific Transportation Company which will handle the traffic of the vessels of the Java Pacific Line in the vitally important rubber and tin trade from the Netherlands East Indies route. New Los Angeles offices were formally opened during late July at 530 West Sixth Street.

The office personnel assembled by Mr. Yenney to operate the new agency will include W. J. Rogers, traffic manager; J. F. Fention, Jr., assistant traffic manager; Jack Rattelman, accountant; Harvey J. Hayes, Jr., claims; Stewart Monro Campbell, clerk; Miss Helen E. Carling, secretary, and Miss Clara Berger, telephone operator.

Mr. Rogers has served for sixteen years with the Dollar Line and the American President Lines, both in this country and in the Orient. All of the staff members have had previous connections with various steamship operations.

Clarence F. Yenney

Mrs. Leland S. Andrews and three-year-old Maureen Elinore Andrews of Maplewood, N. J., on the launching stand at Bath Iron Works, Bath, Maine, where they co-sponsored the 6650-gross ton fast freighter, Extavia, tenth new addition to the American Export Line's freighter, on June 28. They are the wife and daughter of American Export's operating manager

Going After Shipyard "Overflow Work"

Harvey Machine Company of Los Angeles, with a plant covering several acres, one of the most modern machine shops on the Pacific Coast, announces it is equipped to meet any production schedule regardless of size of the job. The work the Harvey organization offers the Pacific Coast marine industry is the field of designing and accurate marine machine work. Designing and construction of all types of special machinery is another Harvey facility, and as the management states, "No job is too tough for us to tackle—that is our motto for many years." The Harvey plant and technical staff works night and day, seven days a week when they have a job to do.

Captain Sears

After many years of uninterrupted service, Captain Arthur H. Sears, veteran ship master and now Coast Pilot for the Weyerhaeuser Line (Pacific Coast Direct Line, Inc.), is leaving on a six weeks' vacation to the East Coast. Captain Sears was formerly master of several of the Luckenbach vessels and during the last war was Lieutenant Commander in the United States Naval Reserve.

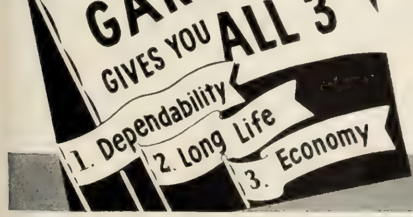
He will visit his former shipmate, Captain P. B. Blanchard, Chairman of the Board of the Pacific Coast Direct Line, Inc., who commanded the S. S. Cabrillo here on the Coast many years ago.

Only GARLOCK MAKES CHEVRON

Garlock 430 Chevron for hydraulic service.
Garlock 431 Chevron for oils at low temperatures.
Garlock 530 Chevron for steam, air or gas.
Garlock 531 Chevron for hot oils.

Adjusts Itself Automatically

Because of its exclusive hinge-like construction Garlock CHEVRON Packing expands and contracts automatically as pressures increase or decrease. Friction on the rod and on the packing itself is thereby reduced to a minimum; long, dependable service is assured. Genuine CHEVRON Packing is made and sold only by Garlock.



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FIRE CONTROL

When the U. S. Navy's mightiest warships the *North Carolina* and the *Washington* are on duty the officers and crew are protected at all times against fire by C-O-TWO*. These battleships have the large installations of carbon dioxide portable fire extinguishers and stationary systems. When the thousand or more new ships of the Navy, from the mile-a-minute PT's to the titanic 45 thousand ton battle wagons, are ready for America's defense, a goodly number of these defenders of our lands will be equipped with C-O-TWO fire equipment.

IT'S SAFER *because* IT'S FASTER

In split seconds C-O-TWO will kill ship fires in engine rooms, cargo holds, galleys, fuel oil tanks and other hazardous spots. Smoke detectors in combination with the Fire-Eye, audible alarm, and time delay units release carbon dioxide gas under perfect control into burning or smoldering spaces. C-O-TWO engineers will work with your own engineers and builders and prepare a survey showing your fire protection requirements. Write today for full information.

*C-O-TWO is the registered trade mark and trade name of the carbon dioxide fire extinguishing equipment manufactured by the C-O-TWO Fire Equipment Co., Newark, N. J.

Typical C-O-TWO Portable Unit. Sizes from 2 to 20 lbs.

C-O-TWO FIRE EQUIPMENT CO.

10 EMPIRE STREET, NEWARK, NEW JERSEY

Sales and Service in the Principal Cities of United States and Canada

(Continued from page 90)

Shipping conferences are a step in the direction of the kind of cooperation necessary, just as stabilization agreements move in the direction of international cooperation on monetary policy, and reciprocal trade agreements on commercial policy, and agreements on air transport and international communications. International shipping conferences will doubtless have to go farther than they have in the past. Certainly they will have to move along *pari passu* with the amplification of efforts for the control of international price levels, Government spending policies, etc.

Whatever develops in this regard, in the peace or armistice period, as the case may be, we must for the present and for the years immediately ahead maintain our Merchant Marine in service on vital trade routes and continue to regard it as a vital war industry and a vital post-war industry.

James Reed

James Reed is Mourned

Regretfully we chronicle the untimely passing of **James Reed,** president of Cramp Shipbuilding Company of Philadelphia and widely known throughout Pacific and East Coast marine and industrial circles.

Mr. Reed was a native of Ohio; he was graduated from the United States Naval Academy in 1902, a classmate of Admiral Emory S. Land. He served at sea as midshipman and ensign for two and half years and, selected for the Naval Construction Corps, was sent to the Massachusetts Institute of Technology for a three-year government course in marine engineering and naval construction, graduating as a Master of Science in 1907.

He was shop superintendent at the Philadelphia Navy Yard until 1909 when he was placed in charge of steel inspection for the Navy in the Eastern area.

Important training in a correlated field then followed with his service with the State Department in furthering American trade in South America.

Returning to this country he held successive posts as Assistant Director of Public Works in Philadelphia and Superintendent of Construction at Mare Island Navy Yard where he supervised the building of the battleship California, of tankers, troopships, sub-chasers, and fourteen destroyers, including the U.S.S. Ward.

Of pertinent interest to our readers, the Ward was launched within seventeen days of keel laying . . . a record never approached.

James Reed had many peaceful settlements of labor problems on the Coast to his credit during his service in 1918 representing the Navy and the Shipping Board before the War Labor Board.

He was assistant general manager of the Los Angeles Shipbuilding & Dry Dock Company until 1923, joining the Celite Corporation as general works manager for a five-year period. Later he assumed the general managership of Schlage Lock Company in San Francisco. During this employment he was named as a member of the city's planning commission.

From 1933 to 1937 he was general manager of the Golden Gate Bridge and Highway District at San Francisco, directly in charge of engineering, finance and construction of this, the world's greatest suspension bridge which spans the mile wide Golden Gate at San Francisco.

In 1937 he made a special comprehensive survey of shipbuilding and its personnel on the Pacific Coast for Chairman Joseph Kennedy of the U. S. Maritime Commission, and from 1937 to 1939 he headed the association of San Francisco Distributors, 200 firms engaged in warehousing, distributing and wholesaling throughout the San Francisco Bay area.

Since 1931 he had been Consulting Professor in the Graduate School of Business at Stanford University.

In 1940 he was named President of Cramp Shipbuilding Company of Philadelphia.

Countless were his friends, for Jim Reed was truly one of God's noblemen!

Guessing Games are Nice

. . . but not for WELDING MEN who want reliable estimates of production costs

With "production-labeled" electrodes, G.E. offers a new welding service that makes estimates easier and more accurate. No more guessing feet per pound or pounds per foot — G.E. puts this production data on the label, where it's handy to use. • Welding operators are enthusiastic about G.E.'s line of heavily coated electrodes because of improved arcing characteristics, better appearance, and higher welding speeds. • Samples at no charge—on request to your nearest G-E arc welding distributor or G-E office. General Electric, Schenectady, N. Y.

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ARC WELDING
ELECTRODES
FOR MILD STEEL
ALL POSITIONS
TYPE W-20
SIZE 1/8" x 14"
80-100 AMP
18-22 VOLTS
USE DC STRAIGHT POLARITY or AC
NP 86543
SCHENECTADY, N. Y
PRODUCTION DATA
This 50 lb. box of electrodes will produce 32.4 lb. of filler metal in joint, based on 2" stub ends.
Welding production is estimated as follows:
1050 linear ft of 1/8" fillet welds
268 linear ft of 1/4" fillet welds
These electrodes will meet AWS specifications Class E-6012
MADE IN U. S. A.

Production data is available on heavily-coated, mild-steel electrodes, "all-position" types, W-20, -22, -25, -30 (1/8- to 1/4-in. dia.) and "flat-position" types, W-23 and W-24 (1/8-in. to 3/8-in. dia.). Data on other sizes on request.

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Are of all steel construction, light weight, small in size, cleanable and many installations have proved them to be most satisfactory. They are approved for marine service and at the present time early shipments can be made.

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Combustion Engineers

SAN FRANCISCO **NEW YORK**

PROGRESS IN *American Shipyards*

★ **Asterisk indicates new listings.**

Pacific Coast

ALBINA ENGINE & MACHINE WORKS, INC.

Portland, Oregon

New Construction:

★ **Hulls Nos. 51-54, four 165′ steel submarine chasers** for U. S. Navy.

ANDERSON & CHRISTOFANI

San Francisco, Calif.

New Construction:

Six 57′ AMC coastal mine sweepers for U. S. Navy.

One 48′ yacht for Hermon Hogrefe.

One 60′ purse seiner for S. Piazza.

ASSOCIATED SHIPBUILDERS

Seattle, Wash.

New Construction:

One insulated self-propelled lighter for delivery to U. S. Navy at Puget Sound Navy Yard.

Four small seaplane tenders for delivery to Puget Sound Navy Yard.

ASTORIA MARINE CONSTRUCTION CO.

Astoria, Ore.

New Construction:

Hull No. 1090, wood hull trawler for stock. 56′ x 15′6″ x 7′6″; 135-hp Superior diesel engine.

Four 135′ wooden diesel-powered mine sweepers for U. S. Navy. Delivery in 14 months.

One 52′ cannery tender for Point Adams Packing Co. 52′ x 16′ x 4′6″; 100-hp Superior diesel engine. **Launched July 15, 1941. Delivered July 20, 1941.**

BASALT ROCK CO., INC.

Shipbuilding Yard
Napa, Calif.

New Construction:

Twelve steel seagoing 1000-ton cargo barges; contractors, Pacific Navy Air Bases. Delivery at San Francisco Bay. 150′ x 40′ x 12′. Contract awarded November 15, 1940. **Delivery dates, first two about April 15; thereafter one every 7 or 10 days.**

Two 10,000-bbl. fuel oil tankers for delivery to Mare Island Navy Yard. 235′ x 37′ x 19′; cost $1,800,000. Contract awarded by Navy Dept., Bureau of S. & A., Washington, D. C. Keel laying date, June 20, 1941.

PACIFIC COAST SUMMARY

Puget Sound

ASSOCIATED SHIPBUILDERS
Seattle, Washington

100% Navy: one lighter, 4 seaplane tenders.

LAKE WASHINGTON SHIPYARDS
Houghton, Washington

Navy: four anti-submarine net tenders, four thousand A. S. N. T. floats, six seaplane tenders.

One Coast and Geodetic Survey ship.

SEATTLE-TACOMA SHIPBUILDING CORP.
Tacoma, Washington

Two C-1, thirty-six C-3.

Navy: five tankers.

Columbia River District

COMMERCIAL IRON WORKS
Portland, Oregon

100% Navy: 4 anti-submarine net tenders, 7 mine sweepers.

WILLAMETTE IRON & STEEL CORP.
Portland, Oregon

100% Navy: two mine layers.

San Francisco Bay District

BETHLEHEM STEEL COMPANY, INC., SHIPBUILDING DIVISION
San Francisco Yard

Two C-1.

Navy: 25 destroyers, 4 cruisers.

GENERAL ENGINEERING & DRY DOCK CO.
Alameda, California

100% Navy: four anti-submarine net tenders, eight mine sweepers.

MOORE DRY DOCK CO.
Oakland, California

Three cargo and passenger vessels (U. S. M. C.), eighteen C-2 cargo vessels.

Navy: three defense vessels, two submarine tenders, five submarine rescue vessels.

WESTERN PIPE & STEEL CO.
South San Francisco, Calif.

One C-1, twenty-one C-3.

Navy: life floats.

Los Angeles District

BETHLEHEM STEEL COMPANY, INC., SHIPBUILDING DIVISION
San Pedro Yard

100% Navy: 10 destroyers.

CONSOLIDATED STEEL CORP., LTD.
Los Angeles, California

Eight C-1-BT, two P1-S2-L2.

Navy: forty-eight steel lighters.

BETHLEHEM STEEL COMPANY, INC.

Shipbuilding Division
San Francisco Yard
San Francisco, Calif.

New Construction:

Hulls Nos. 5362-5364, three C-1 cargo vessels for U. S. Maritime Commission. 395′ x 60′ x 37′6″; 6400 gross tons each; 4000-hp. Full scantling steam propulsion type. Keel laid, No. 5364, January 15, 1941. **Launching** dates, No. 5362, January 10, 1941; No. 5363, March 12, 1941; **No. 5364, July 3, 1941. Estimated delivery date, No. 5362, July 17, 1941.**

Hulls Nos. 5368-5383, sixteen 2100-ton destroyers, DD526-DD541.

Hulls Nos. 5366-5367, two 1650-ton destroyers, DD459-DD460, for U. S. Navy. Keels laid January 13, 1941.

Hulls Nos. 5390-5396, seven 1620-ton destroyers, DD605 - DD611. Keel laying dates, Nos. 5390, 5391, March 25 and 28, 1941.

Hulls Nos. 5386-5389, four 6000-ton cruisers, CL95-CL98.

BETHLEHEM STEEL COMPANY, INC.

Shipbuilding Division
San Pedro, Calif.

New Construction:

Hulls Nos. 9001-9004, four 2100-ton destroyers, DD544-DD547.

Hulls Nos. 9007-9012, six 1620-ton destroyers, DD612-DD617. Keel laying dates, Nos. 9007, 9008, May 1, 1941; Nos. 9009, 9010, May 29, 1941.

BIRCHFIELD BOILER CO., INC.

Tacoma, Washington

New Construction:

One U. S. Coast Guard Cutter for Columbia River and Snake River.

N. J. BLANCHARD BOAT CO.

Seattle, Washington

New Construction:

One sloop, 52′ x 11½′, 50-hp gas engine.

Three 45′ aircraft tenders or rescue boats for the U. S. Navy.

CALIFORNIA SHIPBUILDING CORP.

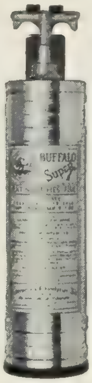
Wilmington, California

New Construction:

★ **Hulls Nos. 1-55, fifty-five EC-2 type cargo vessels** for U. S. Maritime Commission. **Seven keels laid up to July 23, 1941.**

Seaworthy
FIRE PROTECTION
Fast . . . . Effective . . . . Fool-proof

Buffalo
—SUPER—



Approved **Fire Extinguishers**

Placed in convenient locations throughout the ships, Buffalo "Supers" provide sure, quick protection against all kinds of blazes on board. Effectively smothers flames with easy pumping action. Designed for years of marine service. Two sizes: 1 qt. and 1½ qt. Approved by the U. S. Bureau of Marine Inspection. Full details on request. Sold by:

Oregon Marine Supply Co.	Western Fire Equipment Co.	Pacific Marine Supply Co.
Portland and Astoria, Ore.	San Francisco, Calif.	Seattle, Wash.

BUFFALO
FIRE APPLIANCE CORP.
44 CENTRAL AVENUE, BUFFALO, N. Y.

The
KELVIN-WHITE
SPHERICAL COMPASS

has been installed on many new passenger and freight ships for the Maritime Commission and private owners.

* * *

We manufacture all kinds of compasses and binnacles, and are contractors for any and all kinds of Navigational Equipment.

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KELVIN-WHITE CO.
FACTORY IN BOSTON
Represented on the Pacific Coast by
Capt. Frank Jansen, 1361 South Flower Street, Los Angeles
George E. Butler Co., 356 California Street, San Francisco
Nuttall-Styris Co., 825 Columbia St., San Diego, Calif.
Max Kuner Company, 812 First Avenue, Seattle
Pacific Marine Supply Company, Seattle

UNDERSTANDING

It is a deeply satisfying experience to work with men so understanding of your problems, so skilled in interpreting your every requirement, that demand and fulfillment mesh together. Deeply satisfying, too, is the assurance of smooth progression from earliest design to the ultimate installation.

Architects, builders and owners who call upon Hyde to supply their deck machinery, expect and find that understanding. Behind Hyde lies nearly a century of specialized experience, an unequalled reputation for sound design, skilled craftsmanship and absolute integrity.

HYDE WINDLASS COMPANY, BATH, MAINE

West Coast Representative:
Thomas A. Short, 575 Howard Street, San Francisco

IT IS HYDE'S PRIVILEGE TO SUPPLY DECK MACHINERY FOR:

Bethlehem Steel Co. (Shipbuilding Division) Fore River Plant	Newport News Shipbuilding and Dry Dock Co.	Federal Shipbuilding and Dry Dock Co.
U.S.S. SAN DIEGO U.S.S. SAN JUAN	U.S.S. INDIANA U.S.S. HORNET	U.S.S. ATLANTA U.S.S. JUNEAU

HYDE
DECK MACHINERY

COLBERG BOAT WORKS AND STEPHENS BROS.

Stockton, Calif.

New Construction:

Three large wooden mine sweepers for U. S. Navy.

COMMERCIAL IRON WORKS

Portland, Ore.

New Construction:

Four anti-submarine net tenders.

Seven steel mine sweepers for U. S. Navy.

CONSOLIDATED STEEL CORP., LTD.

Los Angeles, Calif.

New Construction:

Hulls Nos. 156-159, four C-1-BT, full scantling, turbine propulsion cargo vessels for U. S. Maritime Commission. Keel laying date, No. 159, April 1, 1941. Launching dates, No. 157, March 27, 1941; No. 158, June 26, 1941; No. 159, September 24, 1941; **Delivery dates, No. 156, August 15, 1941; No. 157, September 29, 1941;** No. 158, November 6, 1941; No. 159, December 23, 1941.

Hulls Nos. 181-182, two Design P1-S2-L2 twin screw turbine propulsion transports for U. S. Maritime Commission. Launching dates January 5 and June 8, 1942. Delivery dates September 26 and November 5, 1942.

Hulls Nos. 162-193; 208-221, 46 steel lighters. Keel laying dates, **No. 206, August 1, 1941;** No. 207, September 22, 1941. Launching dates, No. 206, February 9, 1942; No. 207, May 5, 1942. Delivery dates, No. 206, November 8, 1942; No. 207, November 5, 1942.

Four C-1 cargo vessels.

FELLOWS & STEWART, INC.

Wilmington, California

New Construction:

One 100′ V-bottomed kelp harvester.
Two 45′ taxi boats.

F. L. FULTON

Antioch, Calif.

New Construction:

Six 97′ wooden mine sweepers for U. S. Navy.

GENERAL ENGINEERING & DRY DOCK CO.

Alameda, Calif.

New Construction:

Four anti-submarine net tenders for U. S. Navy.

Eight mine sweepers for U. S. Navy.

HARBOR BOAT BUILDING CO.

Terminal Island, Calif.

New Construction:

Fifteen 60-foot U. S. Navy target boats. Delivery date, first two, June 11; **two on July 10;** and one on **July 15, 1941.**

Hulls Nos. 117-120, **four 136′ motor mine sweepers** for U. S. Navy. Keels laid, No. 117, May 8, 1941; No. 118, May 12, 1941; **No. 119, July 15,** 1941; **No. 120, July 30, 1941. Launching** date, No. 117, **August 15, 1941.**

HUBBARD'S SOUTH COAST COMPANY

Newport Beach, California

New Construction:

Four 45′ twin-screw aircraft tenders for U. S. Navy.

Six 135′ mine sweepers for U. S. Navy.

KRUSE & BANKS SHIPBUILDING CO., INC.

North Bend, Oregon

New Construction:

★ **Hulls Nos. 121-124, four 135′ wooden mine sweepers, YMS type,** for U. S. Navy. Cost $1,800,000.

LAKE WASHINGTON SHIPYARDS

Houghton, Wash.

New Construction:

Four anti-submarine net tenders.

Four thousand A. S. N. T. floats.

Coast and Geodetic Survey ship.

Six seaplane tenders for U. S. Navy.

LOS ANGELES SHIPBUILDING & DRY DOCK CORP.

Los Angeles, Calif.

New Construction:

Hulls Nos. AR6-AR8, three repair vessels for U. S. Navy.

MOORE DRY DOCK CO.

Oakland, Calif.

New Construction:

Hull No. 200, caisson gate for Bureau of Yards and Docks; for D. D. No. 5, Puget Sound, Wash. 150′ x 22′ x 57′; 1800 tons weight. Launching date March 18, 1941. **Delivery date July 1, 1941.**

Hulls Nos. 201-203, three cargo and passenger vessels for U. S. Maritime Commission and Alcoa Steamship Co. 442′x62′x25′; depth molded to bridge deck 41′6″; 8500 hp; 17 knots speed; passenger carrying capacity 38. Keel laying dates, March 26, June 3 and September 10, 1941. Estimated delivery dates January 1, March 15 and June 1, 1942.

Hulls Nos. 204-206, three defense vessels for U. S. Navy and Dravo Corp. 110′ x 34′ x 11′3″ molded depth; two diesel-driven generators. **Delivery dates, No. 204, June 4; No. 205, June 18; No. 206, June 23, 1941.**

Two submarine tenders for U. S. Navy.

Five submarine rescue vessels for U. S. Navy.

Six C-2 cargo vessels.

Twelve C-2 cargo vessels.

Conversion:

Hull No. 195, U. S. S. Tangier, to seaplane tender for U. S. Navy.

PACIFIC BRIDGE CO.

San Francisco, Calif.

New Construction:

One seagoing drydock for U. S. Navy. Cost $1,649,000.

PACIFIC DRY DOCK & REPAIR CO.

Oakland, Calif.

New Construction:

One all-welded steel oil barge. 148′ x 38′ x 9′; 300,000 gal. capacity.

Lighters. Cost $284,572.

SAN DIEGO MARINE CONSTRUCTION CO.

San Diego, Calif.

New Construction:

Four large wooden mine sweepers for U. S. Navy.

One 65′ wooden tuna boat. Estimated launching date, July 1, 1941.

SEATTLE SHIPBUILDING AND DRY DOCK CO.

Seattle, Wash.

New Construction:

Four 136′ mine sweepers for U. S. Navy.

SEATTLE-TACOMA SHIPBUILDING CORP.

Tacoma, Wash.

PLANT No. 1

New Construction:

Hulls Nos. 3, Oregon; No. 4, Cape Fairweather; No. 5, Idaho; three C-1 cargo vessels for U. S. Maritime Commission. Single screw, full scantling diesel propulsion type. Two General M. A. N. 2100-hp engines; 14 knots speed. Launching dates, No. 4, April 11, 1941; No. 5, June 10, 1941. **Delivery dates, No. 3, August 8, 1941; No. 4, July 8, 1941;** No. 5, September, 1941.

Hulls Nos. 6-7, two C-3 shelter deck type cargo steamers for U. S. Maritime Commission. To be converted on completion to U. S. Army troopships. **Keel laying dates,** April 21 and June 16, 1941. Launching dates, October 15, 1941, and January 15, 1942.

Hulls Nos. 8-11, four C-3 cargo ships for U. S. Maritime Commission. 465′ x 69′6″ x 42′6″ (molded); 8900 tons; 8500-hp steam turbine propulsion; cost $2,990,000. Keel laying dates, June 18, October 22, November 1 and 5, 1941. Launching dates, February 12 and 28, and March 1, 1942.

Hulls Nos. 12-16, five U. S. Navy tankers.

Hulls Nos. 17-46, thirty C-3 cargo vessels for U. S. Maritime Commission.

SEATTLE PLANT

New Construction:

Twenty-five destroyers for U. S. Navy.

THE SHAIN MANUFACTURING CO.

Seattle, Washington

New Construction:

One 65′ ferryboat for U. S. Navy.

One model 30 trimmer ship Air Flo sedan for Chas. Cole, Seattle; Chrysler Crown.

One model 36 trimmer ship Air Flo sedan for Paul Isaacson, Seattle; Chrysler Crown.

One model 50 trimmer ship ferry for Horluck Trans. Co., 110-hp Buda diesel.

One model 49 trimmer ship, express cruiser, for stock.

STEPHENS BROS.

Stockton, Calif.

New Construction:

Hull No. 648, cabin cruiser, for stock, 40′ x 11′9″ x 4′6″, 110-hp twin gas engine, total cost $12,500.

Hull No. 661, raised deck cruiser for V. A. Rodden, 39′4″ x 10′9″ x 2′6″, 140-hp twin Chrysler Royals.

Three 136′ wooden mine sweepers.

TODD-CALIFORNIA SHIPBUILDING CORP.

Richmond, Calif.

New Construction:

Thirty cargo vessels for British Purchasing Commission. 10,000 dwt; 416′ long, 57′ beam. Cost $50,000,000.

TODD-SEATTLE DRY DOCKS

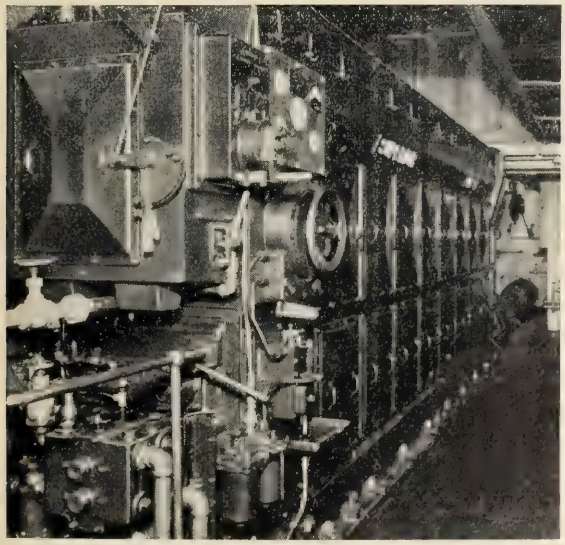
Seattle, Wash.

Conversion work.

★ A TUGBOAT ★
JOINS THE ARMY

The 82' Tugboat, "Colonel Ernest H. Agnew", built for the U. S. Quartermaster Corps by Equitable Equipment Company, New Orleans, and now in active service.

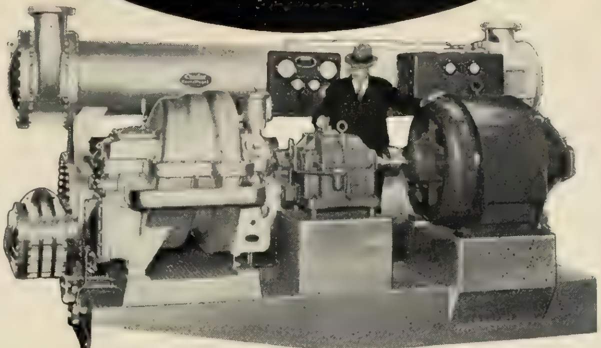
IN buying equipment, the Army demands—and gets—top workmanship in construction and also ability to render A-1 performance under all conditions. For this reason we are very proud that Superior Diesels were selected for both main and auxiliary power in the "Colonel Ernest H. Agnew", one of the most modern tugboats ever built in the South. In every respect these finest of Diesels fully meet the high standard of excellence demanded of those who serve the Flag.



Control end of main power 8-cylinder 12½" x 15", 560 H. P. Superior Diesel, furnished by Mechanical Equipment Company, New Orleans.

THE NATIONAL SUPPLY COMPANY
SUPERIOR ENGINE DIVISION
FACTORIES: Springfield, Ohio; Philadelphia, Pa.
SALES OFFICES: Springfield, Ohio; Philadelphia, Pa.; New York, N.Y.; Los Angeles, Calif.; Jacksonville, Fla.; Houston, Texas; St. Louis, Mo.; Fort Worth, Texas; Tulsa, Okla.; Boston, Mass.

Carrier
Centrifugal
REFRIGERATION



Check these Features

COMPACT—Saves Space and Weight.
EFFICIENT—Mechanical efficiency 98%—no valves, pistons or cylinders to wear.
EASY TO OPERATE—Easily started, picks up load instantly, requires less supervision.
SAFE—Operates at low pressures, using safest refrigerant known.
Ideal for either electric motor or steam turbine drive.
PROVED—Dependable on World's Finest Ships

LOW RUNNING COSTS Developed over 20 years ago by Dr. Willis H. Carrier and his Associates, the Carrier Centrifugal Refrigeration Machine is a close cousin to the steam turbine in operating characteristics. It has the same compactness, long life, efficiency and freedom from service or repairs. Available in a wide range of capacities from 100 to 1000 tons of refrigerating effect.

What's more, the Carrier Centrifugal is thoroughly proved in actual performance, through more than 850 installations on land and sea totaling over 190,000 tons of refrigeration. Among the outstanding ocean-going installations are those aboard the Normandie, Nieuw Amsterdam, Koan Maru and the first vessel to use modern comfort air conditioning, the S. S. Victoria. For further information, write to Carrier Marine Dept., 405 Lexington Avenue, New York City, or . . .

★ PACIFIC COAST HEADQUARTERS ★

GEO. E. SWETT & CO. · 58 MAIN STREET
SAN FRANCISCO · SUtter 8800

WESTERN BOAT BUILDING CO., INC.

Tacoma, Wash.

New Construction:

Hull No. 145, Anna M., live bait tuna boat. Launching date, April 5, 1941. Delivery date, September 1, 1941.

Hull No. 146, fishing boat, 95′ x 24′ x 11′. Keel laid April 15, 1941. **Launching date, July 30, 1941.**

Hulls Nos. 147-148, two U. S. Minesweepers, Y.M.S. 133-Y.M.S. 134. Keel laying dates, No. 147, June 23, 1941; No. 148, **July 20, 1941.**

Conversion:

Fishing boats Majestic and Mahree Star, Ketchikan, Rio Del Mar, Valiant and Challenger conversion to naval use. **Completed.**

WESTERN PIPE AND STEEL CO.

South San Francisco, Calif.

New Construction:

Hulls Nos. 60-61, two C-1 cargo vessels for U. S. Maritime Commission. Full scantling diesel propulsion type; single screw; two Busch-Sulzer 2100-hp engines. Delivery dates, **July 15** and September 13, 1941.

Hulls Nos. 62-65, four C-3 cargo ships for U. S. Maritime Commission. 492′ x 69′ x 42′6″; 8900 tons; 8500-hp; steam propulsion; $2,990,000 each. **Keel laying dates,** February 28, May 5, **August 1** and September 30, 1941. **Launching dates, July 15,** September 15, December 5, 1941, and January 15, 1942. Delivery dates, February 24, May 5, May 15 and June 24, 1942. All above dates estimated.

Navy life floats.

Seventeen C-3 cargo vessels.

WILLAMETTE IRON & STEEL CORP.

Portland, Ore.

New Construction:

Two minelayers, CM6, U. S. S. Catskill, and CM7, U. S. S. Ozark, for U. S. Navy.

Atlantic, Lakes, Rivers

ALABAMA
DRY DOCK & SHIPBUILDING CO.

Mobile, Ala.

New Construction:

Hull No. 223, 6500-ton tank ship for National Bulk Carriers, Inc. 416′ x 56′ x 35′, 2400-hp diesel. Launched April 30, 1941.

Hulls Nos. 226-227, two steel barges, 105′ x 32′ x 7′. Launched March 25, 1941.

Hulls Nos. 228-229, two tugs for Mobile Towing & Wrecking Co. **Launching dates, August, 1941.**

Hull No. 230, tug, for stock. Launching date, September, 1941.

Hulls Nos. 231-243, thirteen all-welded Emergency cargo vessels for U. S. Maritime Commission. Cost $19,500,000.

★ **Hull No. 244, 18,000-ton floating dock,** for Todd Shipyards Corp., Galveston.

LESTER F. ALEXANDER CO.

New Orleans, La.

New Construction:

Two tugs, North Star **and Peggy Wilson,** 68′ x 17′ x 8′, 275 hp.

One all-welded steel barge, 110′x30′x7′6″.

AMERICAN BRIDGE COMPANY

Pittsburgh, Pa.

New Construction:

Ten freight barges for Inland Waterways Corp., St. Louis, Mo. 280′ x 48′ x 11′.

Eight dump scows. 160′ x 50′6″ x 13′6″; for Panama Canal.

Two fueling scows for Carnegie Illinois Steel Co. 125′ x 26′ x 11′.

★ **Ten coal barges** for stock. 175′ x 26′ x 11′.

AMERICAN CAR & FOUNDRY CO.

Wilmington, Delaware

New Construction:

Thirty-eight 45′ lighters, equipped with tanks for carrying liquids, for U. S. Navy. Total cost $1,020,262.

Eight 45′ welded steel twin screw lighters, for War Dept., Quartermaster Corps, diesel propelled. Total cost $173,126. **Completed.**

Four 135′ mine sweepers for Navy Dept., Bureau of Supplies and Accounts. Total cost $1,340,000.

THE AMERICAN SHIP BUILDING CO.

Cleveland, Ohio

New Construction:

Twelve net tenders for U. S. Navy; (6 at Lorain, Ohio; 6 at Cleveland, Ohio). 151′8″ x 30′6″ x 16′6″; diesel-electric propulsion; contract price $6,357,000.

Four diesel trawlers for General Seafoods Corp. 146′8″ L. O. A. x 26′0″ x 14′4″. (2 at Lorain, Ohio; 2 at Cleveland, Ohio.) Delivery date, November 15, 1941.

Eight mine sweepers (4 at Lorain, Ohio; 4 at Cleveland, Ohio) for U. S. Navy; 220′ O.A. x 32′ x 17′; diesel-electric propulsion; contract price, $13,736,000.

Two bulk freighters (at Lorain, Ohio) for Pittsburgh Steamship Company; 640′ O.A. x 67′ x 35′; geared-turbine propulsion. Delivery date, October 1, 1942.

Fifteen 2500-ihp, three cylinder triple expansion engines for Maritime Commission design EC2-S-C1 cargo vessels.

BATH IRON WORKS

Bath, Maine

New Construction:

Hulls Nos. 184-187, four cargo ships for American Export Lines. 400′ x 60′ x 39′. Delivery dates September and October, 1941, and April and June, 1942.

Hulls Nos. 188-189, DD457 and DD458, two destroyers for U. S. Navy. Delivery dates December, 1941, and February, 1942.

Hulls Nos. 190-195, DD449-451, 467-469, six destroyers for U. S. Navy.

Hulls Nos. 196-206, DD507-DD517, eleven destroyers for U. S. Navy.

Hulls Nos. 208-213; DD629-DD631; DD 642-DD644; six destroyers for U. S. Navy.

BETHLEHEM STEEL COMPANY, INC.

Shipbuilding Division

Fore River Yard

Quincy, Mass.

New Construction:

Hull No. 1478, Massachusetts, 35,000-ton battleship for U. S. Navy. Keel laid July 20, 1939.

Hulls Nos. 1479, San Diego; and 1480, San Juan; two 6000-ton cruisers for U. S. Navy. Keels laid March 27 and May 15, 1940.

Hull No. 1484, cargo vessel for U. S. Maritime Commission. 450′ x 66′ x 42′3″; 16½ knots; geared turbines and water tube boilers; 14,500 tons. Launching date November 16, 1940.

Hulls Nos. 1485-1487, three tankers. 502′ x 68′ x 37′; 21,000 tons. Keels laid July 1, August 7 and September 26, 1940. Launching date, No. 1485, March 15, 1941; No. 1486, May 24, 1941. **Delivery dates, No. 1485, May 1, 1941; No. 1486, June 27, 1941.**

Hulls Nos. 1488-1491, four tankers for Sinclair Refining Co., 10,700 tons dwt. Keels laid, No. 1488, November 21, 1940; No. 1489, March 18, 1941; No. 1490, May 31, 1941. Launching date, No. 1488, May 29, 1941.

Hulls Nos. 1492-1493, two tankers for Sinclair Refining Co. 15,450 tons dwt.

Hulls Nos. 1494-1497, four heavy cruisers for U. S. Navy. Keel laying date, No. 1494, May 26, 1941; No. 1495, June 30, 1941.

Hulls Nos. 1498-1501, four light cruisers for U. S. Navy.

Hulls Nos. 1502-1503, two light cruisers for U. S. Navy.

Hulls Nos. 1504-1507, four heavy cruisers for U. S. Navy.

Hulls Nos. 1508-1511, four aircraft carriers for U. S. Navy. **Keel laying date, July 15, 1941.**

Hulls Nos. 1512-1515, four trawlers. Keels laid, Nos. 1512-1513, March 26, 1941; No. 1514, June 14, 1941; No. 1515, July 12, 1941. **Launching dates, No. 1512, June 12, 1941; No. 1513, July 10, 1941. Delivery date, No. 1512, July 12, 1941.**

Hulls Nos. 1516-1519, four 1650-ton destroyers for U. S. Navy. Keel laying date, No. 1517, May 20, 1941.

BETHLEHEM STEEL COMPANY, INC.

Shipbuilding Division

Sparrows Point Yard

Sparrows Point, Md.

New Construction:

Hull No. 4343, Robin Kettering; cargo vessel for Seas Shipping Co. LOA 485′, beam 66′, draft 43′. Launching date January 18, 1941. **Delivered May 29, 1941.**

Hull No. 4348, C-1 cargo vessel. LOA 417′, LBP 395′, beam 60′, depth 37′6″.

Hulls Nos. 4350-4352, three cargo vessels for Seas Shipping Co. 450′ x 66′ x 34′; 6300 hp; 8500 gross tons. Keel laying dates, No. 4351, December 12, 1940; No. 4352, January 22, 1941. Launching date, No. 4350, May 17, 1941. **Delivery date, No. 4350, July 16, 1941.**

Hulls Nos. 4353-4356, four oil tankers for Socony Vacuum Oil Co. 487′6″ x 68′ x 37′; 12,000 hp, 9800 gross tons. Keel laying dates, No. 4353, August 12, 1940; No. 4354, September 12, 1940; No. 4355, April 23, 1941. Launching date, No. 4353, April 19, 1941.

Hull No. 4357, oil tanker for Union Oil Co. of Calif. 442′ x 63′ x 34′10″; 3500 hp; 8000 gross tons. Keel laying date, December 26, 1940. Launched June 14, 1941.

Hulls Nos. 4358-4359, two oil tankers for Socony Vacuum Oil Co. 487′6″ x 68′ x 37′; 12,000 hp; 9800 gross tons.

Hulls Nos. 4360-4361, two oil tankers for Union Oil Co. 442′ x 64′ x 34′10″; 3500 hp; 8000 gross tons. Keel laying date, No. 4360, June 18, 1941.

Hulls Nos. 4362-4364, three cargo and passenger vessels for Mississippi Shipping Co. 465′ x 65′6″ x 39′9″; 8600 hp; 8300 gross tons.

Hull No. 4365, oil tanker for Richfield Oil Co. 442′ x 64′ x 34′10″; 3500 hp; 8000 gross tons. Keel laid May 21, 1941.

Hulls Nos. 4367-4368, two oil tankers for Panama Transport Co. 487′6″ x 68′ x 37′; 7000 hp; 9800 gross tons.

Hull No. 4369, oil tanker for Continental Oil Co. 442′ x 64′ x 34′10″; 3500 hp; 8000 gross tons.

Hulls Nos. 4371-4372, two oil tankers for Gulf Oil Co. 442′ x 64′ x 34′10″.

Hull No. 4373, tanker for Panama Transport Co. 487′6″ x 68′ x 37′; 7000 hp; 9800 gross tons.

Hulls Nos. 4374-4375, two tankers for Union Oil Co. of Calif. 487′6″ x 68′ x 37′; 7000 hp; 9800 gross tons.

Hulls Nos. 4376-4377, two tankers for Socony Vacuum Oil Co. 487′6″ x 68′ x 37′; 7000 hp; 9800 gross tons.

BETHLEHEM STEEL COMPANY, INC.

Shipbuilding Division
Staten Island Yard
Staten Island, N. Y.

New Construction:

Hull No. 8019, one C-1-B design cargo vessel for U. S. Maritime Commission.

Hulls Nos. 8021-8022, two destroyers for U. S. Navy.

Hulls Nos. 8023-8029; 8033-8035; ten destroyers for U. S. Navy.

BURGER BOAT CO.

Manitowoc, Wisconsin

New Construction:

One yacht, 65′x16′x8′, Buda diesel engine.

One ferryboat, 110′ x 32′ x 8′, 330-hp Gray diesel engine.

Six 135′ wooden motor mine sweepers for U. S. Navy.

IRA S. BUSHEY & SONS, INC.

Brooklyn, N. Y.

New Construction:

Hull No. 490, tug. 90′; 805-hp F-M diesel. **Delivery date, July, 1941.**

Hull No. 494, tug. 90′; 805-hp F-M diesel. **Delivery date, August 15, 1941.**

Hull No. 496, tug. 90′; 805-hp F-M diesel. **Delivery date, August, 1941.**

Hull No. 497, tug. 90′; 805-hp F-M diesel. Delivery date, September, 1941.

Hull No. 498, 156-foot oil tanker. Delivery date, November, 1941.

Hull No. 499, 156-foot oil tanker. Delivery date, January, 1942.

Hull No. 500, wooden drydock section for Bethlehem Steel Co. Delivery date, October, 1942.

CALUMET SHIPYARD & DRY DOCK CO.

Chicago, Illinois

New Construction:

Hull No. 123, towboat for Ashland Oil & Refining Co., 140′ x 32′ x 9′, 1600-hp diesel engine.

One river towboat for A. L. Meschling Barge Line, 70′ x 20′, 210 hp Superior diesel.

One all-welded Corten steel crawler crane barge, for U. S. Engineers Office, St. Paul, Minn., 66′ x 45′ x 7′.

Four all-welded distribution box boats for Quartermaster Corps., U. S. Army, 65′ x 18′, diesel propelled. Total cost $212,000.

Hull No. 126, all-welded steel towboat for Ashland Oil Refining Co., 145′ x 32′ x 9′, 1600-hp diesel.

★ **Hulls Nos. 131-132, two oil barges, standard river type,** for Ashland Oil & Refining Co. 195′ x 35′ x 10′.

★ **Hulls Nos. 133-135, one three-barge unit** for Ashland Oil & Refining Co. Each unit, 195′ x 35′ x 10′; center section square on both ends; both end sections square on one end, raked on opposite end.

★ **Hull No. 136, one river towboat** for Ashland Oil & Refining Co. 245′ x 32′ x 90′. 1600-hp diesel.

CHARLESTON SHIPBUILDING & DRYDOCK COMPANY

Charleston, South Carolina

New Construction:

Six 205′ mine sweeping fleet tugs. Delivery for all within 26 months.

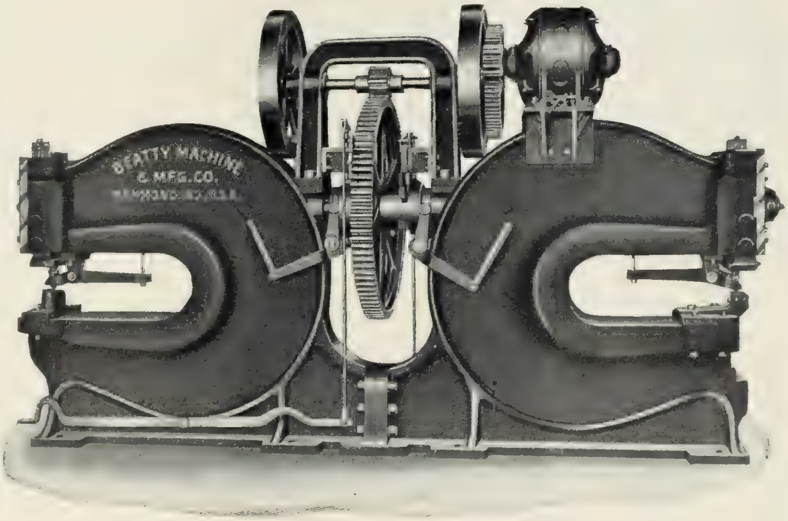
CONSOLIDATED SHIPBUILDING CORP.

Morris Heights, N. Y.

New Construction:

Seven 165′ steel submarine chasers for U. S. Navy.

BEATTY Modernized
POWER PUNCHES and SHEARS



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CONSOLIDATED STEEL CORP. OF TEXAS
Orange, Texas

New Construction:

One steel oil barge for Sears Oil Co., 196′ x 40′ x 13′. Delivered July 2, 1941.

Two oil barges for C. F. Pillot, 165′ x 36′ x 10′3″.

Six all-welded steel oil barges for Inland Waterways Corp., 196′ x 35′ x 10′6″.

One drilling barge for Shell Oil Co., Inc., 118′ x 44′ x 10′.

One boiler barge for Shell Oil Co., Inc., 90′ x 30′ x 10′.

★ **One transportation barge** for Shell Oil Co., Inc. 80′ x 24′ x 5′.

★ **Three transportation barges** for Shell Oil Co., Inc. 40′ x 16′ x4′6″.

CRAMP SHIPBUILDING COMPANY
Philadelphia, Pa.

New Construction:

Six cruisers, Cleveland class, for U. S. Navy.

DEFOE BOAT & MOTOR WORKS
Bay City, Mich.

New Construction:

Hull No. 167, PC452, sub-chaser for U. S. Navy. 174′ long Delivery date, September, 1941.

Hulls Nos. 171-174, four mine sweepers for U. S. Navy, 220′ long.

Twelve 165-foot escort vessels for U. S. Navy.

Eight 175-foot sub-chasers for U. S. Navy.

DELTA SHIPBUILDING CORP.
New Orleans, Louisiana

New Construction:

★ **Twenty-five EC-2 Emergency type vessels** for U. S. Maritime Commission. 416′ x 56′10¾″ x 37′4″; 2500-hp triple expansion engine.

THE DRAVO CORPORATION
Engineering Works Division
Pittsburgh, Pa., and Wilmington, Del.

New Construction:

Hulls Nos. 1789-1790, two sand and gravel barges for Keystone Sand Division. 135′ x 27′ x 8′; 510 gross tons.

Hulls Nos. 1806-1807, two gate vessels for Bureau S. & A., Navy Dept., Washington, D. C. 930 gross tons.

Hulls Nos. 1835-1840, six 165′ type PC submarine chasers for U. S. Navy, Washington, D. C. 2010 gross tons.

Hulls Nos. 1856-1861, six sand and gravel barges for Keystone Sand Division. 135′ x 27′ x 8′; 1530 gross tons.

Hulls Nos. 1862-1867, six welded steel oil barges for stock, 195′ x 35′ x 9′9″; 3588 gross tons.

Hulls Nos. 1868-1869, two 25-ton floating cranes, one each to Phil. and Norfolk U. S. Navy Yards, for U. S. Navy Dept., Washington, D. C.; 670 gross tons.

Hulls Nos. 1870-1875, six welded steel deck barges for Delaware, Lackawanna & Western R. R., 100′ x 30′ x 9′6″; 1392 gross tons.

Hulls Nos. 1876-1877, two floating caisson gates for U. S. Navy, Philadelphia Navy Yard; 2330 gross tons.

Hulls Nos. 1886-1902, seventeen welded hopper barges for Pittsburgh Coke & Iron Co.; 175′ x 26′ x 11′; 8024 gross tons.

Hull No. 1903, floating caisson gate for U. S. Navy, Norfolk Navy Yard; 1330 gross tons.

Hulls Nos. 1904-1906, three welded sand and gravel barges for Cumberland River Sand Company; 130′ x 24′6″ x 6′6″; 579 gross tons.

Hulls Nos. 1907-1911, five 165′ type AM mine sweepers for Bureau Supplies & Accounts, U. S. Navy Dept., Washington, D. C.; 1675 gross tons.

Hulls Nos. 1912-1916, five 165′ type PC submarine chasers for Bureau of Supplies & Accounts, U. S. Navy Dept., Washington, D. C.; 1675 gross tons.

Hull No. 1927, fabricated steel hull for oil barge. 165′ x 35′ x 10′; 502 gross tons.

Hulls Nos. 1928-1933, six welded steel deck barges for Delaware, Lackawanna & Western R. R., New York City. 100′ x 30′ x 9′6″; 1392 gross tons.

Hulls Nos. 1934-1945, twelve welded steel oil barges for stock; 195′ x 35′ x 9′9″; 7176 gross tons.

Hulls Nos. 1946-1955, ten W-7 welded steel coal barges for stock; 175′ x 26′ x 11′; 4720 gross tons.

Hull No. 1956, 25-ton floating crane for Charleston, S. C. Navy Dept., Washington, D. C.; 335 gross tons.

★ **Hulls Nos. 1957-1966, ten type W-7 welded bulk cargo barges** for stock. 175′ x 26′ x 11′; 4720 gross tons.

★ **Hulls Nos. 1967-1972, six welded oil barges** for stock. 195′ x 35′ x 9′9″; 3588 gross tons.

★ **Hulls Nos. 1973-1976, four welded sand and gravel barges** for Keystone Sand Div. 135′ x 27′ x 8′; 1020 gross tons.

★ **Hulls Nos. 1977-1986, ten type W-7 welded bulk cargo barges** for stock. 175′ x 26′ x 11′; 4720 gross tons.

★ **Hulls Nos. 1987-1992, six welded oil barges** for stock. 195′ x 35′ x 9′9″; 3588 gross tons.

★ **Hulls Nos. 1993-2009, seventeen covered lighters** for Bureau of Supplies and Accounts, Navy Dept. 8840 gross tons.

ELECTRIC BOAT COMPANY
Groton, Conn.

New Construction:

Two submarines, SS206, Grampus; SS208, Grayback; for U. S. Navy. Cost $2,937,000 each. Keels laid, Grampus, February 4, 1940; Grayback, April 3, 1940.

One submarine, SS204, Mackeral, for U.S. Navy. Keel laid October 6, 1939. Launched September 28, 1940.

Three submarines, SS212, Gato; SS213, Greenling; SS214, Grouper; for U. S. Navy. Cost $2,957,000. Keels laid, Gato, October 5, 1940; Greenling, November 12, 1940.

Thirteen submarines, SS215, Growler; SS216, Grunion; SS217, Guardfish; SS218, Albacore; SS219, Amberjack; SS220, Barb; SS221, Blackfish; SS222, Bluefish; SS223, Bonefish; SS224, Cod; SS225, Cero; SS226, Corvina; SS227, Darter. Cost $2,795,000 each.

Twenty-five submarines, SS240-SS264.

THE FEDERAL SHIPBUILDING AND DRY DOCK COMPANY
Kearny, N. J.

New Construction:

Hulls Nos. 168-169, CL51, Atlanta; and CL52, Juneau; two 6000-ton cruisers for U. S. Navy. Keels laid April 22 and May 27, 1940.

Hulls Nos. 179-186, eight C-2 cargo ships for U. S. Maritime Commission. Keel laid, No. 179, December 27, 1940; No. 180, April 17, 1941. Launching date, No. 179, May 29, 1941. **Delivery date, No. 179, July 15, 1941.**

Hulls Nos. 190-193, four tankers for Sinclair Refining Co. 15,000 dwt. Keel laid, No. 190, November 12, 1940; No. 191, April 17, 1941. Launching date, No. 190, June 7, 1941.

Hulls Nos. 194-197, four destroyers for U. S. Navy. Keels laid, Nos. 194-195, December 2, 1940; Nos. 196-197, December 16, 1940.

Hulls Nos. 198-203, six destroyers for U. S. Navy.

Hulls Nos. 204-205, two destroyers for U. S. Navy.

Hulls Nos. 206-213, eight destroyers for U. S. Navy.

Hulls Nos. 214-218, five destroyers for U. S. Navy.

Hulls Nos. 219-221, three cruisers for U. S. Navy.

Hulls Nos. 222-227, six destroyers for U. S. Navy.

Hull No. 228, one C-2 cargo ship for U. S. Maritime Commission. Keel laid, February 10, 1941. **Launched July 11, 1941.**

Hulls Nos. 229-230, two destroyers for U. S. Navy.

Hulls Nos. 231-232, two destroyers for U. S. Navy.

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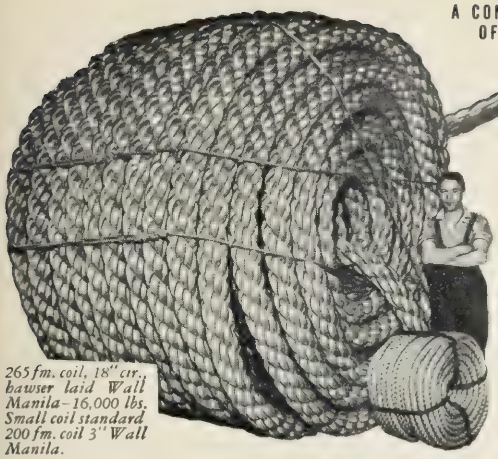
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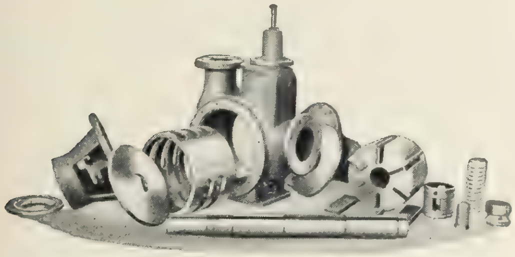

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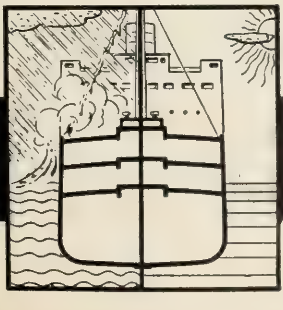

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Hulls Nos. 233-240, eight cargo ships for the U. S. Maritime Commission.

Hulls Nos. 241-264, twenty-four C-2 cargo vessels for U. S. Maritime Commission.

GREAT LAKES ENGINEERING WORKS
River Rouge, Michigan

New Construction:

Hulls Nos. 287-289, three bulk freighters for Pittsburgh S. S. Co. 640' x 67' x 35'; 18,000 dwt; 4000-hp steam turbine engines.

HENRY C. GREBE & CO., INC.
Chicago, Illinois

New Construction:

One 70' twin-screw diesel cruiser yacht.

Two 135' mine sweepers for U. S. Navy.

GREENPORT BASIN & CONSTRUCTION CO.
Greenport, L. I., N. Y.

New Construction:

Four coastal mine sweepers, AMC46-49, for U. S. Navy.

Four coastal mine sweepers, AMC61-64, for U. S. Navy.

Twelve 135' motor mine sweepers for U. S. Navy.

GULFPORT BOILER & WELDING WORKS, INC.
Port Arthur, Texas

New Construction:

Hull No. 168, one diesel-electric tug for General Motors Corp. 100' x 24' x 12'4"; 1000 shp G.M. diesel and auxiliary each. **Delivery date, July 5, 1941.**

Hull No. 176, diesel tug for General Motors Corp. 100' x 24' x 12'4"; 680 hp. **Delivery date, August 15, 1941.**

Hulls Nos. 185-187, three oil barges for Butcher-Arthur Corp., Houston, Texas. 165' x 36' x 10'9". **Delivery dates, No. 185, August 1; No. 186, August 15; No. 187, August 30, 1941.**

Hull No. 189, diesel tug for General Motors Corp. 100' x 24' x 12'4"; 680 hp. Delivery date, September 5, 1941.

GULF SHIPBUILDING CORP.
Chickasaw, Ala.

New Construction:

Four 2100-ton destroyers for U. S. Navy.

Four vessels for Waterman Steamship Corporation. 445' x 63' x 40'6"; shelter deck type; geared turbine drive; 15½ knots service speed.

THE INGALLS SHIPBUILDING CO.
Pascagoula, Miss., and Decatur, Ala.

Pascagoula

New Construction:

Hulls Nos. 268, 297-299, four C-3-IN passenger-cargo vessels for U. S. Lines. Completion dates, May, November, December, 1942; and February, 1943.

Hulls Nos. 265-267, three C-3-P passenger-cargo vessels for American-South African Line, Inc. Completion dates, November, December, 1941; and January, 1942.

Hulls Nos. 293-296, four C-3-S-A-2 cargo vessels for U. S. Maritime Commission. Completion dates, February, March, May and June, 1942.

★ **Hulls Nos. 325-336, twelve C3-S-A2 cargo vessels** for the U. S. Maritime Commission. 492' x 69'6" x 42'6".

Decatur

New Construction:

Hull No. 309, landing barge for Government of Venezuela. 295' x 49'3" x 7'6"; barge No. 1. **Delivery date, July 23, 1941.**

Hull No. 310, landing barge for Government of Venezuela. 147'6" x 34'6" x 7'6"; barge No. 2. **Delivery date, July 23, 1941.**

Hull No. 311, landing barge for Government of Venezuela. 60' x 34'6" x 5'; barge No. 3. **Delivery date, July 23, 1941.**

Hull No. 312, ferry float and ramp for Government of Venezuela. 24' x 30' x 5'. **Delivery date, July 23, 1941.**

Hulls Nos. 313-314, two sand and gravel barges for stock. 110' x 26' x 6'6". Delivery date, September 1, 1941.

Hulls Nos. 318-319, two deck barges for West Virginia Pulp and Paper Co., N. Y. 105' x 32' x 7'. **Delivery date, August 15, 1941.**

Hulls Nos. 343-344, two 39,000-bbl oil barges for Eddie Erlbacher, Cape Girardeau, Mo. 195' x 35' x 9'9". Delivery date, November 25, 1941.

Hulls Nos. AN 1-4, four net layers for U. S. Navy.

★ **Four 9,000-bbl oil barges** for Standard Oil Company, Cleveland, Ohio. 195' x 35' x 9'9". Delivery date, December 1, 1941.

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Two 127′ fish trawlers for Booth Fisheries Co. Diesel powered.

Five boats for repair work for U. S. Navy.

Ten 165′ submarine chasers for U. S. Navy.

LEVINGSTON SHIPBUILDING CO.

Orange, Texas

New Construction:

Hull No. 185, ocean tug for U. S. Navy; 135′ x 30′ x 17′6″.

Hulls Nos. 194-195, two tugs for stock. 66′ x 17′ x 8′; 300-hp Atlas diesel.

Hull No. 199, tug. 85′ x 23′ x 9′6″.

Hull No. 201, barge for U. S. Navy. 173′ x 8′6″ x 39′.

Hulls No. 202, tug, for Pan American. 74′ x 20′ x 9′; 400-hp Atlas diesel.

Hull No. 203, 85′ coastwise tug for stock. 85′ x 24′ x 9′11″; 600-hp Atlas diesel.

Hulls Nos. 204-205; 207-210; six 8500-bbl oil barges for Pan American.

Hull No. 206, tug, for stock. 74′ x 20′ x 9′; 400-hp Atlas diesel.

Hull No. 211, tug. 105′ x 25′ x 9′6″; 1000-hp General Motors diesel.

Hull No. 212, tug, for stock. 105′ x 25′ x 13′6″; 1000-hp General Motors diesel.

Hull No. 213, tug, for stock. 85′ x 23′ x 9′6″; 600-hp Superior diesel.

Hull No. 214, tug, for stock. 74′ x 20′ x 9′; 400-hp Atlas diesel.

THE LUDERS MARINE CONSTRUCTION CO.

Stamford, Connecticut

New Construction:

Seven 65′ Naval tugs, YT160-YT169. Cooper-Bessemer diesel engines.

Two submarine chasers, PC505-PC506, for U. S. Navy.

Nine small subchasers for U. S. Navy.

Six 65′ all-welded steel, single-screw distribution box boats for Quartermaster Corps, U. S. Army. Diesel propelled.

Three 165′ steel subchasers for U. S. Navy. **Keel laid, first vessel, July, 1941.**

Four wooden subchasers for U. S. Navy.

MANITOWOC SHIPBUILDING CORP.

Manitowoc, Wisconsin

New Construction:

Ten submarines, SS265-274, for U. S. Navy.

One streamlined passenger and auto carrier, Milwaukee Clipper, for Sand Products Corp. 361′ x 45′ x 28′. **Delivered.**

MARIETTA MANUFACTURING CO.

Point Pleasant, W. Va.

New Construction:

Hull No. 419, one steam stern-wheel towboat for Union Barge Line Corp., Pittsburgh, Pa. 167′ x 37′6″ x 8′2″.

Hulls Nos. 455-456, two all-welded steel bulk oil barges for stock. 195′ x 35′ x 10′.

Hull No. 457, all-welded steel fuel oil barge for Union Barge Line Corp., Pittsburgh, Pa. 135′ x 26′ x 9′.

Four net tenders, YN13-16, for the U. S. Defense Commission. Total cost $2,040,000. Launching dates, March 20, April 17, June 19, **July 2, 1941.**

Hulls Nos. 474-485, twelve all-steam propelled mine planters, for the U. S. Army. Cost about $12,000,000. **Keel laying dates,** No. 474, May 14; No. 475, May 20; No. 476, June 24; **No. 477, July 11, 1941.**

MARINE IRON & SHIPBUILDING COMPANY

Duluth, Minnesota

New Construction:

Hull No. 70, 180′ cutter of "Cactus" type for U. S. Coast Guard. Total cost $673,299.

JOHN H. MATHIS CO.

Camden, N. J.

New Construction:

Four anti-submarine net tenders for U. S. Navy.

One bulk carrier tanker 265′ long for Thos. Bowes, N. A.

★ **Three 220′ mine sweepers** for U. S. Navy.

MIAMI SHIPBUILDING CORP.

Miami, Florida

New Construction:

Two 54′ wooden hull motor torpedo boats for U. S. Navy, PT1-2. Cost $89,875. Keels laid, July 12, August 19, 1939. Launching dates, August 16, September 30, 1939.

Eleven high-speed, off-shore patrol boats.

Six 30′ Harbor Communication boats.

NEWPORT NEWS SHIPBUILDING & DRYDOCK CO.

Newport News, Va.

New Construction:

Hull No. 378, battleship 58, Indiana, for U. S. Navy. **Keel laid November 20, 1939.**

Hull No. 384, one single-screw combination passenger and cargo vessel for U. S. Maritime Commission. 465′ x 69′6″ x 42′6″; gross tonnage about 9100 tons. Delivery date, September, 1941.

Hull No. 385, aircraft carrier No. 8, Hornet, for U. S. Navy. Launched December 14, 1940.

Hull No. 386, single-screw combination passenger and cargo vessel for U. S. Maritime Commission. 465′ x 69′6″ x 42′6″; gross tonnage about 9100 tons. Delivery date, October, 1941.

Hull No. 389, one single-screw cargo vessel for International Freighting Corp., Inc. 435′ x 63′ x 40′6″; gross tonnage about 8000. **Delivery date, August 1, 1941.**

Hulls Nos. 390-391 (CL62-CL63), two light cruisers for U. S. Navy.

Hulls Nos. 392-394 (CV9-CV11), three aircraft carriers for U. S. Navy.

Hulls Nos. 395-398 (CV12-CV15), four aircraft carriers for U. S. Navy.

Hulls Nos. 399-400 (CL80-CL81), two light cruisers for U. S. Navy.

THE NEW YORK SHIPBUILDING CORPORATION

Camden, N. J.

New Construction:

BB57, South Dakota, battleship for U. S. Navy. Keel laid July 5, 1939.

AR5, Vulcan, repair ship for U. S. Navy. Keel laid December 26, 1939.

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CL55, Cleveland; and CL56, Columbia; two cruisers for U. S. Navy. Order placed March 23, 1940.

CL57 and CL58, two cruisers for U. S. Navy. Order placed June 12, 1940.

AV7, Currituck, seaplane tender for U. S. Navy.

CL59-CL61, three cruisers for U. S. Navy.

CB1-CB6, six cruisers for U. S. Navy.

CL76, four cruisers for U. S. Navy.

NORTH CAROLINA SHIPBUILDING CO.
Wilmington, N. C.

New Construction:

Thirty-seven all-welded steel EC-2 cargo ships for U. S. Maritime Commission.

THE PUSEY & JONES CORP.
Wilmington, Del.

New Construction:

Hulls Nos. 1075, Marina; 1076, two C-1A cargo ships. Launching date, No. 1076, August, 1941. Delivery dates, No. 1075, August, 1941; No. 1076, November, 1941.

Hulls Nos. 1082, Hains; and 1083, Hoffman; two seagoing hopper dredges for War Dept., U. S. Engineers Office, Philadelphia, Pa. 215′10½″ x 40′ x 15′6″; approx. 2000 gross tonnage; diesel-electric propulsion, 950 shp. Delivery dates, February and August, 1942.

★ **Hulls Nos. 1084-1093, ten C-1A type** cargo ships for U. S. Maritime Commission. 412′3″ x 60′ x 37′6″; 9000 dwt; 4000-hp steam turbine propulsion.

R. T. C. SHIPBUILDING CORP.
Camden, N. J.

New Construction:

Hull No. 136, 1700-ton motor tanker, T. W. Drennan. 260′ x 42′ x 18′. **Launching date, July 19, 1941.**

Hull No. 137, 995-ton motor tanker. 190′ x 36′ x 12′.

Hulls Nos. 138-139, two 985-ton motor tankers. 190′ x 36′ x 12′.

SUN SHIPBUILDING AND DRY DOCK COMPANY
Chester, Pa.

New Construction:

Hulls No. 186, Rio Hudson; No. 187, Rio Parana; No. 188, Rio de la Plata; No. 189, Rio de Janeiro; four C-3 cargo and passenger liners for Moore-McCormack Lines. 492′ x 69′6″ x 42′6″; 8500 gross tons; diesel propelled; 8500 shp; 16½ knots. **Delivery dates, August,** September, October and November, 1941.

Hulls Nos. 199-206, eight C-2 cargo vessels for U. S. Maritime Commission. 474′ x 63′ x 40′6″; 7400 gross tons; diesel propelled; 7500 shp; 16 knots. **Launching dates,** No. 199, May 24; No. 200, June 21; **No. 201, July 21;** No. 202, September 6; No. 203, October 4; No. 204, November 11, 1941; Nos. 205-206, 1942. **Delivery dates, No. 199, July; No. 200, August;** No. 201, September; No. 202, November; No. 203, December, 1941; Nos. 204-206, 1942.

Hulls Nos. 208-210, three tankers for Petroleum Shipping Co. 520′ x 68′ x 37′; 10,400 gross tons; turbine; 4000 shp; 13 knots. Launching dates, No. 208, March 29; No. 209, May 10; No. 210, June 9, 1941. **Delivery dates,** No. 208, June 13; **No. 209, July 12; No. 210, August, 1941.**

Hulls Nos. 213-216; 219-220, six tankers for Panama Transport Co. 547′3″ x 70′ x 40′; 11,400 gross tons; 7500 shp; 15 knots speed. Launching and delivery dates, 1942-1943.

Hulls Nos. 217-218, two tankers for Standard Oil Co. of N. J. 547′3″ x 70 x 40′; 11,400 gross tons; 7500 shp; 15 knots speed. **Launching dates, No. 217, August 2;** No. 218, September, 1941. Delivery dates, No. 217, October; No. 218, November, 1941.

Hulls Nos. 221-222, two tankers for Keystone Tankship Corp. 520′ x 68′ x 37′; 10,600 gross tons; turbine; 12,000 shp; 16½ knots. Keel laying dates, November 15 and December 15, 1941. Launching dates, No. 221, November 22, 1941; No. 222, 1942. Delivery dates, No. 221, January, 1942; No. 222, 1942.

Hulls Nos. 223-225, three tankers for The Texas Co. 513′10″ x 68′ x 36′; 9300 gross tons; turbine; 9000 shp; 16 knots. Launching and delivery dates, 1942.

(Page 114, please)

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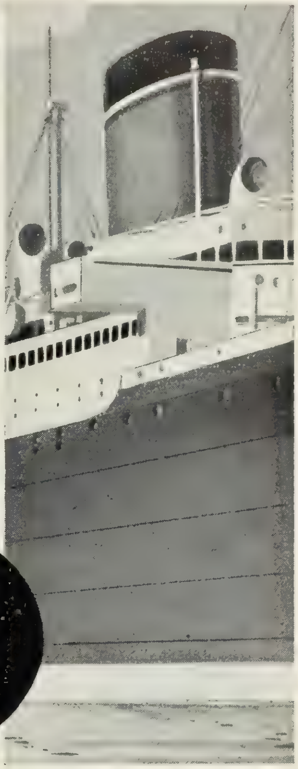

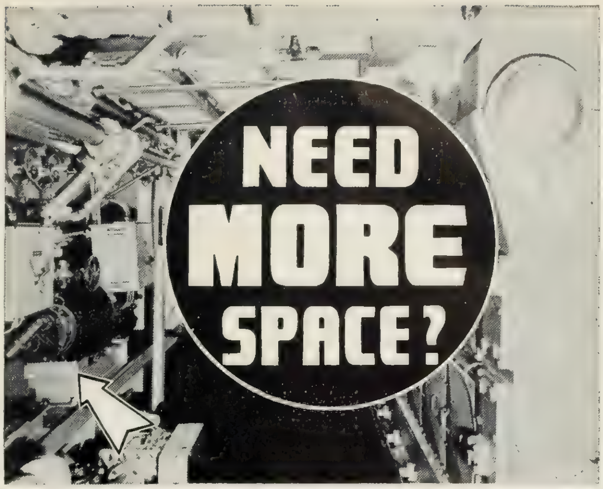

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Keep Posted

(Continued from page 74)

be whittled with a knife. Surfacing can be done with a planer. The material is thermoplastic, and hence can be shaped by heating to 190 degrees or higher and bending while hot.

Besides its obvious importance in the insulation field, the new material is being used in defense activity. One of the first applications is in life-saving jackets. Tests show that it is ten times more resistant to water than commonly used cork or balsa wood.

Cellular rubber is also being used for heat insulation under the decks of mosquito-type torpedo boats, and, because of its lightness, in supports for self-sealing gas tanks in airplanes.

Million-Volt Radiography of Boiler Drums

One of the first million-volt industrial x-ray units ever built is being installed by Combustion Engineering Company in its Chattanooga boiler shops. The development of an industrial unit of this rating was initially announced by the General Electric Company in December, 1940, when they dedicated the installation at Schenectady of the pioneer million-volt industrial unit, as part of the program commemorating the 40th anniversary of the G-E research laboratory.

The unit for Combustion Engineering, built by the General Electric X-ray Corporation, exceeds by 600,000 volts the rating of the largest previous industrial units. It is capable of radiographing 8-inch steel in good commercial time and will effect a tremendous reduction in the time required for radiography of welded seams of the usual thickness required in boiler drums and other high pressure vessels. The walls of the drums for modern high pressure boilers range in thickness from about 3 inches to 5 inches or more. The new unit will radiograph 5-inch thick plate in about 5 minutes at a focal distance of 48 inches, and 3-inch plate at the same focal distance can be penetrated in 48 seconds. With the 400,000-volt unit, the most practical focal distance for these thicknesses is 32 inches, and at this distance the exposure time for the corresponding thicknesses are: 5-inch plate, 135 minutes; 3-inch plate, 2½ minutes.

Thus a two-fold time saving will be effected—the reduction in exposure time which increases rapidly with metal thickness (more than 100 times as fast at 5½ inches) and reduction in number of negatives because of the longer focal distance which can be used. The importance of the latter results from the large number of exposures required to radiograph the seams of big drums—several hundred per boiler in some cases—and the time consumed in setting-up for each exposure. Another important advantage is the superior quality of the negatives obtained which provide a wealth of sharp diagnostic detail even at maximum penetration.

The new unit is being installed in a separate building of substantial size built especially to house it. The walls are of 18-inch concrete to provide adequate protection against escape of stray x-rays. The operator's room is separated from the main part of the building by the full wall thickness. The unit itself consists of a resonant transformer within which is a coaxially-mounted, multisection, high vacuum x-ray tube, both contained in a grounded steel tank and employing compressed gas (Freon) insulation. The x-rays are generated from a target mounted in the end of an extension chamber projecting out from one end of the electrically grounded tank. The unit is rated at one million volts and 3 milliamperes continuous current. A particularly spectacular aspect is that the unit produces energy equal to $90,000,000 worth of radium.

The addition of this unit to the five smaller x-ray units now installed in Combustion Engineering shops will assist materially in handling the company's heavy volume of defense work.

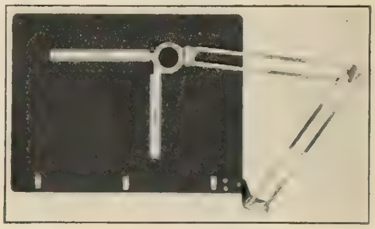
New Tachometer Has Many Uses

For use in measuring revolutions per minute, feet per hour, gallons per minute in any manufacturing plant where rotating equipment is used, a new alternating current tachometer is announced by Westinghouse Electric and Manufacturing Company.

Known as Type A-80, the tachometer consists of an alternating current generator and a voltmeter of the rectifier type. No brushes or commutator are used in the generator which is of the permanent magnet, a-c inductor type. To insure permanency of calibration the magnets are made of high grade magnet steel and are carefully aged.

The rotating element consists of laminated iron keyed to a rust resisting steel shaft. Laminations are slotted to permit variation of the air gap reluctance when the shaft is rotated. This in turn varies the flux linking the voltage coils and induces an alternating voltage in the coils. The alternating voltage is rectified by a Rectox unit in the voltmeter calibrated in rpm, feet per hour, or other units depending on the application.

Although the best generator speed is 1000 rpm, the tachometer is recommended for operation over a range of from zero to 5000 rpm. This range may be obtained, if necessary, by suitable pulleys, gears, or sprockets. Overall tachometer accuracy is ½ per cent of full scale.

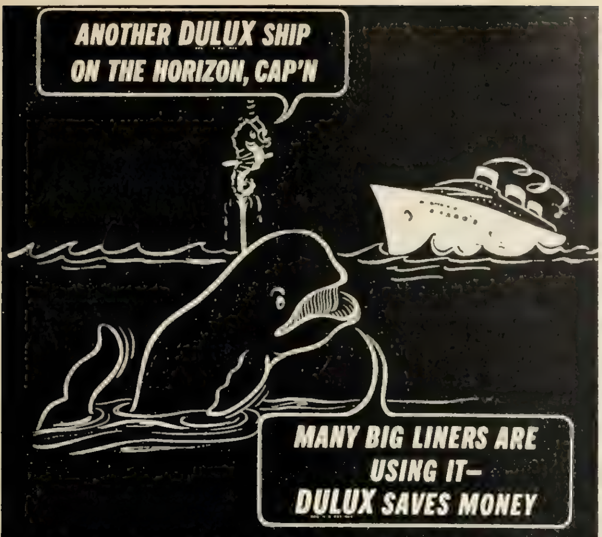


Portable Drawing Machine

A line of portable drawing machines, taking paper sizes from 9″ x 12″ to 18″ x 24″, is announced by The Drafto Company. All models are mounted on Masonite board with parallel arms and protractor plates constructed of stainless steel.

Two small size models, known as No. 10 and No. 15, which take paper sizes 9″ x 12″ and 10″ x 15″, feature scales made in one piece, permanently attached to the protractor plate. The protractor for these models is graduated in two degrees, and clamping device provides equal locking tension at all angles to prevent slippage.

Two larger sizes, No. 30 and No. 35, have a capacity for drawings to 12″ x 18″ and 18″ x 24″. Protractor for these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peep-hole, presents the widest angle of dark segment. This indication is sharp, positive, unmistakable, for accurate dial settings. The percentage of carry-over present in the condensate is now read directly off the dial. Also, the instrument will open or close its relay contacts for the controlling of an external circuit, at whatever reading the main dial is set. Meanwhile, the setting of the temperature knob is not critical for warning purposes, and may be left at approximately the condensate temperature. It may be as much as 10 degrees off the actual condensate temperature, yet the accuracy of the percentage reading or warning will not be off more than .3 part per million plus or minus, at a reading of 3 ppm, which is usually negligible.

Braided Wire Rope Slings

Here is a 35-ton section of the submarine Peto being lowered into keel blocks in the Manitowoc Shipyards, Manitowoc, Wisconsin.

Two 80′ Macwhyte Drew braided wire rope slings are being used to make the installation. The Peto is the first of ten submarines to be built for the United States Navy at the Manitowoc Shipyards.

This installation required lifting members wide enough to reduce the unit pressure of the load. The Macwhyte Drew slings are designed to meet the call for a sling body with a wide, belt like surface. They are especially well adapted for this kind of work.

Bronze-Welding Repairs On Axis Vessel Engines

In spite of the severe damage to the main engines and other vital control parts of the German and Italian cargo vessels which the United States Government took over last April, repair work is being speeded to the point where a number of these ships will again be in service by the middle of the summer. The illustrations herewith, taken on the Italian freighters San Giuseppe and Vittorin, show how bronze-welding has made possible the repair of the main engines without the necessity for removing these engines from the ships.

On each ship, U-shaped sections had been broken out of the walls of the intermediate pressure cylinders just below the steam ports. After new sections were cast to fit the contour of the breaks, they were bronze-welded in place, as shown here. Starting at the bottom of the U, the operator alternated from one side to the other every 3 in., first half-filling the vee, peening the deposited metal, then completing the weld and peening. This procedure minimized contraction stresses on cooling.

The lower picture shows clearly the appearance of one of the completed welds following rough-boring. Other parts on these ships which were repaired by bronze-welding include main engine valves, cylinder heads, fire pumps, air pumps, feed pumps, foundation columns, and steering engines. Both San Giuseppe and Vittorin are under the protective custody of the Treasury Department, with repair work being supervised by the Maintenance and Repair Division of the U. S. Maritime Commission.

◆

Progress in American Shipyards

(Continued from page 108)

Hull No. 226, tanker for Kaymar Tankship Corp. 520′ x 68′ x 37′; 10,600 gross tons; turbine; 12,000 shp; 16½ knots. Keel laying date, 1942.

Hulls Nos. 227-228, two tankers for Seamar Tankship Corp. 520′ x 68′ x 37′; 10,600 gross tons; turbine; 12,000 shp; 16½ knots. Keel laying dates, 1942.

Hull No. 229, tanker for Atlantic Refining Co. 543′10″ x 70′ x 40′; 11,600 gross tons; turbo-electric; 5000 shp; 13 knots. **Launching date, July 9, 1941.** Delivery date, September, 1941

Hull No. 230, tanker for Atlantic Refining Co. 474′ x 65′ x 37′; 8000 gross tons; turbo-electric; 5000 shp; 14½ knots. Launching date, December 6, 1941. Delivery date, 1942.

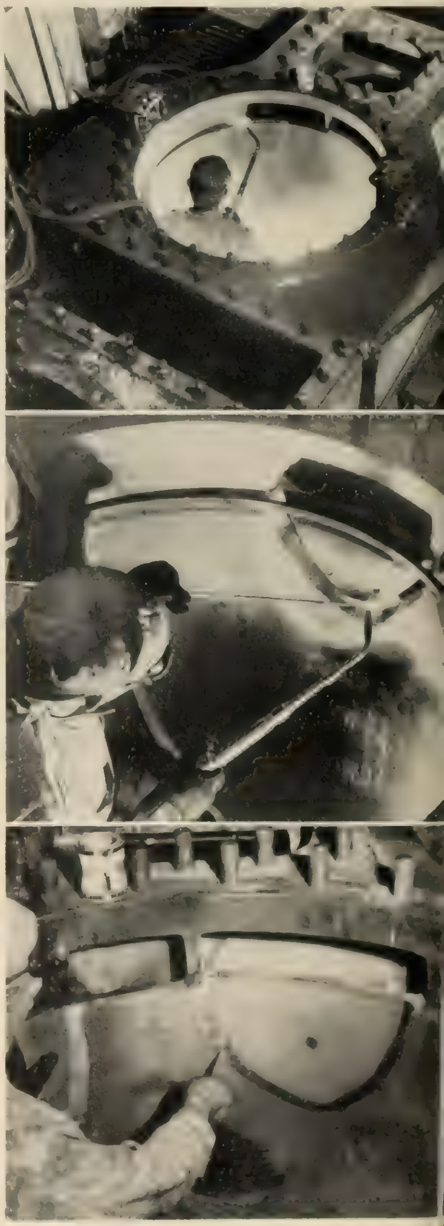
Hulls Nos. 231-232, two tankers for Keystone Tankship Corp. 520′ x 68′ x 37′; 10,600 gross tons; turbine; 12,000 shp; 16½ knots. Delivery date, 1942.

Hulls Nos. 233 and 240, two tankers for Gulf Oil Corp. 485′ x 68′ x 36′; turbine propelled; 14½ knots. Delivery dates, December, 1942, and March, 1943.

Hull No. 234, tanker for Sun Oil Co. 547′3″ x 70′ x 40′; 11,400 gross tons; diesel propelled; 7500 shp; 15 knots. Delivery date, 1942.

Hulls Nos. 235 and 237, two tankers for Standard Oil Co. of N. J. 547′3″ x 70′ x 40′;

(Page 118, please)



Bronze-welding cylinders on engines of Axis ships

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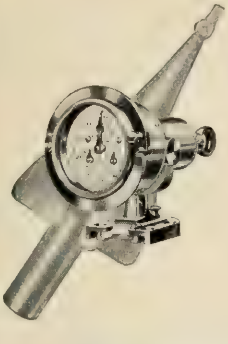

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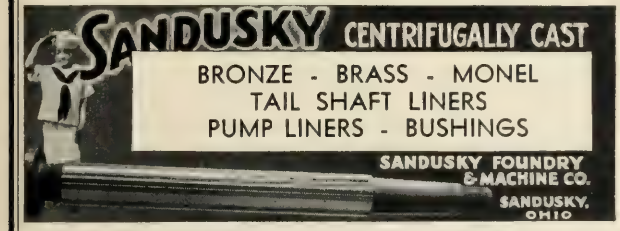

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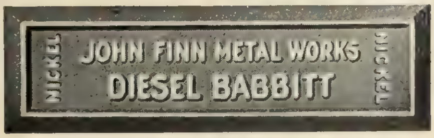

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The Catalogs of Today Become the Technical Handbooks of Tomorrow

Safe Use of Wire Rope. Recognizing that safety is an all-important consideration in every industrial operation, more especially now when we must bend every effort to increase production and retain skilled workmen, the Hazard Wire Rope Division of the American Chain & Cable Company, Inc., has recently issued a most comprehensive booklet on the safe use of wire rope.

This new booklet gives tables of breaking strengths for all commonly used rope constructions, together with safety factors for the principal rope applications. It also offers constructive information on the effects of acceleration, the various constructions and grades of wire rope, and suggestions for the correction of operating factors affecting safety such as abrasion, bending fatigue, reverse bends, kinking, spooling, crushing and corrosion.

In addition the booklet tells when to discard (and also how to correct) wire rope with broken and porcupined outer wires; how properly to lubricate rope; how to apply attachments; and how properly to inspect wire rope.

It gives tables for the safe sizes of sheaves and drums, and how to calculate the safe groove diameters. While the booklet is 24 pages in volume, it is folded for convenient pocket use.

Taylor Made Products: S. G. Taylor Chain Company, Hammond, Indiana, has recently released a new series of bulletins bound in catalog form. This 28-page, 8½″ x 11″ catalog illustrates and describes many types and grades of chain made by the manufacturer.

One section is devoted to sling and crane chains; another features such items as BBB coil chain, high carbon electric weld loading chain and log chain.

Of interest to engineers, maintenance men and other chain users are the data relating to "proof tests," chain terminology and tables illustrating safe loads for chains and slings for different variations in the angle of the load.

A copy of this catalog may be obtained by writing this publication.

C-1-B Cargo Steamers, a leaflet distributed by the De Laval Steam Turbine Co., describing Joseph Lykes, Zoella Lykes, Reuben Tipton, Fred Morris and John Lykes, built for the Lykes Bros. Steamship Co. by the Federal Shipbuilding & Dry Dock Co. The De Laval Steam Turbine Co., Trenton, N. J., supplied the 4000 shp compound steam turbine and double reduction gear installed for propulsion in each vessel. This company also supplied for each ship two 250 kw geared, turbine-driven generators; and the main and auxiliary circulating pumps, main and auxiliary condensate pumps, fire pump and bilge pump; also fuel oil burner and transfer service pumps, lubricating oil service pumps and portable cargo oil pumping units, of the De Laval-IMO type. The centrifugal pumps, of a new design with vertical shaft and with the driving motor mounted above the pump, are illustrated.

Electric Couplings, a new 6-page folder, F-8635 of the Westinghouse Electric and Manufacturing Company, describing electric couplings for transmitting engine torque to the gear in diesel powered vessels between 500 and 5000 horsepower.

Advantages and construction features of the couplings are discussed with an explanation of the electrical principles involved in their operation. Centralization of control and installation flexibility are described and illustrated.

Hydraulic Flanging and Forming Press. A black and red, four-page pamphlet, bulletin No. 400 of the Beatty Machine & Manufacturing Co., Hammond, Indiana. This handsome brochure illustrates and describes a 400-ton and a 250-ton flanging and forming press, especially designed for shipyard work.

All details of general dimensions, working characteristics and control are fully set forth.

Rotary Pumps with Double Helical Gears, bulletin W-483-B1, a 12-page, black and orange, profusely illustrated booklet published by Worthington Pump and Machinery Corp.

These rotary pumps are applied in thousands of installations covering every type of industrial activity. Type GRV is a vertical shaft pump adapted to general shipboard service. Type GEC is especially designed for liquid cargo unloading. Brief descriptions cover each type in the complete line. Convenient selection tables, viscosity data, relation of A. P. I. oil scale to specific gravity, and expansion of petroleum oils with temperature are also included.

Commercial Heat-Treating, a handsome red and black, 10-page booklet just published by Abegg and Reinhold Company, Ltd., of Los Angeles.

This booklet describes the shops and laboratories of the firm and illustrates many of the details and assemblies they have treated. Their patrons range

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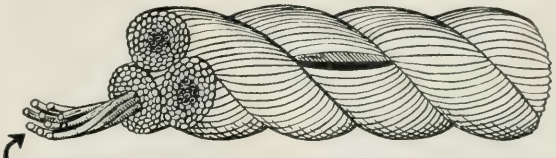
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Steamline Savings. A leaflet published by the Pressure Jet Corporation and describing the advantages of the Pressure Jet system for keeping the steam lines and all interior surfaces of steam-heating surfaces free from scale and corrosive pitting, and at the same time keeping the steam in good condition.

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Progress in American Shipyards

(Continued from page 114)

11,400 gross tons; turbine; 7500 shp; 15 knots. Delivery date, 1942.

Hull No. 236, tanker for Atlantic Refining Co. 543'10" x 70' x 40'; 11,600 gross tons; turbo-electric; 5000 shp; 13 knots. Delivery date, 1942.

Hulls Nos. 238-239, two tankers for Standard Oil Co. of Calif. 521' x 70' x 40'; turbine propelled; 15½ knots. Delivery dates, January and March, 1943.

Hulls Nos. 241-312, seventy-two tankers.

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Pacific MARINE REVIEW

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CONVENTION

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The October issue of the Pacific Marine Review will be ready for the mails on October 1, three weeks in advance of the opening of the nation's most important marine event of 1941.

A thorough circulation during the four days of the Convention and Conference to the marine leaders in attendance will augment the magazine's regular distribution.

* * *

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Pacific Marine Review

Editorial Comment

Tonnage Costs

In practically all the metal industries, estimators of manufacturing, assembly or construction costs have in their minds a checking figure for cost per ton of material fabricated and/or assembled. This is a very convenient way of checking estimates. In fact, estimators of long experience can frequently make bids offhand simply by estimating the weight of the finished structure.

In shipbuilding on a quantity production basis, this same idea of cost per ton is often used. However, the term ton in the realm of shipbuilding and ship operating has a very widely varying meaning.

During the last great war shipbuilding effort, the U. S. Emergency Fleet Corporation used the term "cost per deadweight ton" to compare construction costs. By "deadweight ton," they meant the total dwt of the ship, as, for instance, their "8800-tonner." Now this total dwt of a cargo vessel includes: the weight of stores carried; the weight of water carried; the weight of fuel carried; the weight of crew and passengers and baggage; and the weight of cargo. It does not include the weight of the hull, machinery and equipment. It includes nothing that the shipbuilder has built.

The press and the releases from the Maritime Commission still use this figure of cost per dwt for comparative purposes, calling it cost per ton which is obviously misleading. All comparisons of cost per ton between ships or between buildings should be made on a basis of the weight of the structure manufactured or built, not on the weight of the contents placed therein by the owner after taking delivery of the finished structure.

This is especially true in America today when the shipbuilder has practically no influence on the design of the ship. A cargo vessel of one type design might weigh 2500 tons and have a total dwt of only 3000, while another design weighing 3500 tons might have a total dwt of 9000. The first of these vessels today might cost $1,250,000 in an American yard, while the second would cost $1,800,000. Obviously it would be very unfair to say that on this basis that the shipbuilder's figure on the first example was $416 per ton, while on the second it was only $200 a ton. The facts would be that in the first case the costs were $500 a ton and in the second case the costs were $514 a ton.

These are extreme examples but well within the range of possibilities.

The chief responsibility of the naval architect is so to design a ship that she can be built at the least cost per ton of hull and that her hull weights will form as low a proportion of her total displacement as is consistent with safety, stability and propulsive efficiency.

Other factors being equal, the larger a steel cargo vessel the more cargo she will carry per ton of hull weight.

In comparing shipbuilding costs, let's keep our tonnage definitions straight.

A Notable Expansion

The expansion of the Shipbuilding Division of the Consolidated Steel Company, under the capable management of Mr. Alden Roach, is a remarkable industrial triumph.

In September, 1939, this Los Angeles firm was awarded a contract to build four C-1-B cargo steamers. They leased a shipyard at Long Beach for erecting these jobs. Today, they are building an 8-way yard on Los Angeles Harbor and a 4-way yard at Orange, Texas. They have contracts for 36 C-1s, two navy transports and 12 destroyers.

Frontiersmen of the Future

by

Captain Edward Macauley
U. S. Maritime Commissioner

The spectacle of this new plant with its magnificient equipment, its beautiful training ship, and its hundreds of fine young men, is a sight to fill the eye of any seafaring man. But the members of the Maritime Commission cannot properly congratulate themselves on this newest addition to the Commission's activities without first congratulating the man to whom more than any other is due the credit for the rapid growth and high standards of our whole training program. I am referring to Mr. Telfair Knight, director of our Division of Maritime Training, who is with us today, and whose labors have built up the Training System in two years from scratch to an organization that in the current fiscal year will have given training to almost 7000 men.

And I want also to congratulate and on the part of the Maritime Commission to commend and thank the United States Coast Guard and the able officers and petty officers of that service, who have been administering our Training Program for unlicensed men and administering it in a way that can only command my unstinted admiration.

As I look around at the golden-brown hills of California, over the blue Pacific, and breathe this clear air, I am thankful that there is such a place, that I am a Californian here with you today to enjoy it, and to

Captain Edward Macauley, U. S. Maritime Commissioner, and an honored citizen of California, flew west to dedicate the new training station at Hueneme, California, on August 30, 1941. The article herewith is an abstract of his speech on that occasion.

(Courtesy of S. F. Chamber of Commerce)

claim it as my own. After months at a desk in the steaming heat of Washington, I am envious of you who are privileged to live here, and most of all of the young men who will work and be trained here in the service of my own first love, the sea.

The seas have never been so important as they are today. The future of civilization and the whole course of history for centuries to come depend at this moment upon the control of the sea by the navies of the United States and Great Britain. And the very factors that have made sea power so potent in deciding wars and thus shaping history have in a less dramatic way made seaborne commerce equally potent in shaping civilization.

You men are in the Merchant Marine. Both in peace and in war, the daily active use of your skill and ability is essential to the welfare of our country. In peace, your work is constructive and civilizing as perhaps no other active occupation is. In war, you take your place as worthy partners of the Army and Navy in the first line of defense.

In speaking of the officers and crews of the American merchant ships who transported supplies across the Atlantic for the American Expeditionary Force, our greatest naval leader of the World War, Admiral Sims, said:

"The skill and seamanship of these sailors was something that amazed naval officers, and they proved themselves to be seamen in a sense that naval officers never have the opportunity to become. The courage, initiative, and sense of responsibility, skill in handling ships of all types, and noteworthy seamanship characterized the merchantmen. . . . Without the merchantmen's skill, courage and loyalty the war could not have been won."

The present shipbuilding program is colossal. An idea of the magnitude of the immediate construction effort —the building of the 312 emergency ships, the 200 added ships in the long-range program, as well as 60 British emergency ships, plus the 566 ships just authorized—may be gained when I tell you that the steel requirements for hulls alone will be 3,210,000 tons. The requirements for the ships now building, other than those just mentioned, are 515,000 tons, making the enormous total of 3,725,000 tons of steel for ships' hulls.

Important as are all these figures about shipyards and ways, tons of steel and numbers of vessels, they are no more important than the men who are to man the ships, for in the last analysis the usefulness of the ships depends on the crews. Our training service program and facilities, of which this splendid plant is a part, are to assure that America shall grow in greatness and power on the sea, and that the young men who choose the sea as their careers may be properly equipped to do their part. To choose the sea as your career is no ordinary choice. It is a noble and important calling that demands the very best we as a nation have to offer.

Now there are some plain and simple facts about the sea and the seafaring life that can be put in plain and simple words. Of all present-day occupations none demands so forcibly those qualities that are grouped together under the word "character"—the qualities of self-discipline, responsibility, courage, stick-to-it-iveness, loyalty, strength and steadiness of mind and spirit. It is a life that demands sacrifice from the beginning. It holds forth no fair promise of quick and easy reward. It does not seduce with the hope of getting something for nothing. You have to have guts to go into it. You have to have guts to stay in it.

The sea demands more of men, but it gives more. No one who knows the meaning of the word "shipmate" can fail to understand that it is that the sea gives, the feeling of standing and working together, of individual strength and energy being pooled together for the safety and welfare of all, the sense of one's only antagonist being the elements that surround him, not the fellow beings with whom he lives and works.

It is there that one can put one's finger on that universal feeling that there is something inherently "better" about the life of the sea. Even those who hate it look on it with a sort of awe. All men sense that there is something about the sea bigger than themselves. We are aware that what is most stultifying to man is his daily strife with other men. All the evil in the world lies in men's lack of understanding of each other. It is evil that men should live by what they get out of other men. But at sea, man's enemy is not his fellow man. On board ship men live and prosper according to how well they work with each other, not against each other.

And so you young men may well feel that you have entered a fine profession and one to be proud of. In working and training here to be sailors, you are not trying just to make something for yourselves, you are making something out of yourselves. You are carrying on a tradition that has made America great! You are the frontiersmen of the future!

S. S. Exceller, first of a series of fast freighters designed and engineered by American Export Lines, which is now on its maiden voyage to India under the command of Capt. Hugh L. Switzer. Launched at Bath Iron Works, May 10, when she was sponsored by little Henrietta Gehan, daughter of John F. Gehan, the Lines' vice president. Exceller is 420 feet overall length, and is rated at 6597 gross tons. During the builder's trials early this month, Exceller steamed at an average speed of 19.46 knots in all trial runs

American

Merchant Marine on the Job!

With the economic fabric of the nation suddenly subjected to a strain heavier than any ever before put upon it, it is interesting to observe the varied ingenuity being employed to meet this unprecedented strain effectively. American enterprise, generally, has two obligations thrust upon it: (1) to serve every interest of National Defense, which is paramount; and (2) to serve vital civilian needs.

The nicety with which these two obligations are adjusted is important to *both*. To National Defense, it is important that private enterprise be shifted enough to insure no stinting of defense effort. To private enterprise, it is important that no more shifting be done than is consonant with defense effort, lest production necessary for civilian needs be disastrously curtailed.

One of the most vital American enterprises seeking the correct adjustment of the two primary obligations is the American merchant marine. Suddenly, it is being called upon to

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Thousands of tons of commerce and thousands of passengers are carried annually under these blue and buff stacks to and from the ports of the South Pacific

The four white passenger liners of the Matson fleet are Queens of the Pacific and the fastest, most luxurious quartette of passenger liners under the American flag

Matson cargo liners are equipped to handle general cargo outbound, largely sugar and pineapple homeward bound. Today, they are handling every type of National Defense cargo and doing it with great efficiency and dispatch

perform a titanic two-way job. It must provide prodigious tonnage for shipment of supplies, bulky machinery, building materials, and endless equipment required by the Army and Navy, not only within our own wide borders, but in distant outposts which cover a large part of the globe. At the same time, it must find room in its bottoms for the flow of merchandise, absolutely necessary for civilian needs, in order that the economic structure of the nation may be kept on an even keel. Our merchant marine must do all this under the most trying circumstances, with the time limits pressing relentlessly.

Nowhere has the national emergency been more pressing upon our merchant marine than in the Pacific. The activity of the Army and Navy in the great reaches of the Pacific has suddenly thrust a staggering burden of unprecedented weight upon this arm of our marine. A survey of western shipping in its rising to this occasion offers an interesting study from which to judge the effectiveness we may expect to find wherever our merchant marine functions.

The Matson Line offers a good example for this study, both because of its recognized importance in Pacific regions, and because it has had to face and solve all the typical problems that have confronted the American merchant marine as a whole.

At the start, we find that all we have said about the staggering burden imposed upon our merchant marine applies to this line specifically. Here is a shipping company that, in 1939, was fully adequate to Hawaii's approximately normal commerce with the rest of the nation, amounting to about $200,000,000 annually. To provide for this 200,000,000-dollar commerce, plus the normal tourist travel to and from Hawaii of around 50,000 passengers, and over 11,000 passengers to and from Australia and South Sea ports en route, the Matson Line operated 36 ships. Thirty-two of these ships were freighters, and four were the great passenger liners, Lurline, Matsonia, Mariposa and Monterey.

Of the thirty-two freighters, eighteen were in the regular East-Coast-to-Hawaii service. Five sailed regularly from San Francisco and Los Angeles to Hawaii. Two maintained an exclusive San Francisco-to-Hawaii service. Seven ships took care of the Northwest business, of which two called at Puget Sound, and five at Northwest ports to pick up lumber.

The four beautiful liners, Lurline, Matsonia, Mariposa and Monterey, maintained a regular service from San Francisco and Los Angeles to Hawaii, Samoa, Fiji, New Zealand and Australia. The Lurline and Matsonia served Hawaii exclusively. The Mariposa and Monterey supplemented this Hawaii service, and provided for New

Zealand and Australia and the ports en route. All four ships, in addition to providing passenger accommodations, also maintained a fast freight service, especially important to Hawaii.

This was the picture two years ago. Then men started marching in Europe. America shifted rapidly from a relatively passive apprehension to an active desire to arm. Although not geared to defense effort, defense became the cry. The nation became border conscious, aware of two important fronts . . . the Atlantic and the Pacific. Defense projects in Hawaii, U. S. A., and outlying Pacific Islands, were about to begin clamoring for ships to speed men and materials to vital defense areas.

Suddenly, the Matson Line saw looming a task the dimensions of which were to break all records, and for which no anticipation could have prepared. It saw huge tonnage demanded of its ships by cargo, much of which would be strange, bulky, requiring special mechanical equipment to load and unload, and more space in ships' holds to accommodate it. It saw thousands of workers with their families, Army and Navy personnel and their families, all rushing to the defense hub in Hawaii. And, all the while, it saw the demands of nearly a half million regular inhabitants of Hawaii, who have long relied on its ships. It recognized that Hawaii buys 60 per cent of its foodstuffs from the mainland, not to mention livestock, feed, lumber, machinery, fertilizers, petroleum products, and innumerable other commodities indispensable to the Territory's welfare, and it recognized that these vital wants of Hawaii must be met, irrespective of abnormal demands.

One of the abnormal demands that quickly became insistent throughout the shipping world was for ships. This demand created numerous opportunities for quick and impressive profits. Quite naturally, some steamship lines took advantage of these opportunities. They sold some of their ships. They leased cargo capacity of others. The Matson Line was in a position to profit by these opportunities, except for one fact, namely, its obligation to Hawaii.

A Traditional Obligation

Matson's obligation to Hawaii was a tradition. It dated back to 1888, when Captain William Matson founded the line, since which time it has been the principal carrier between the Islands and the mainland. The obligation could not be set aside, nor did the Matson Line hesitate in deciding on its course of action. It would meet the staggering demands of National Defense, and it would also continue to serve Hawaii's vital needs.

This decision demanded speed in four different directions: (1) More ships must be built, and quickly. (2) Carrying capacity of existing ships must be stepped up. (3) More frequent sailings must be scheduled, between the West Coast and Hawaii. (4) Passenger capacity must be enlarged, in the face of an impending rush of workers in National Defense, of Army and Navy personnel, and the families of all three groups. What to do was clear enough. The perplexing question was . . . *HOW?*

HOW it was done is drama, with high-speed action, streamlined. It is a drama of ships building; ships being whisked from one ocean to another; ports being overhauled and new machinery set up; sailings multiplied; mountains of new cargo moving; and thousands of people speeding to defense centers in the Pacific.

Increased Cargo Capacity

As a starter, four new freighters were ordered, each with a carrying capacity of 12,000 deadweight tons. Improved lines and motive power gave these ships a speed of better than 16½ knots, importantly lopping ten days off the running time between New York and Hawaii.

Simultaneously, the Matson Line turned its attention to ships already on hand. Cargo capacity was increased. Water tanks were converted into oil tanks, boosting Matson fleet capacity to 485,633 barrels of oil. The 8500-ton freighter, Waimea, was refitted to specialize in carrying bulk cement, a highly necessary defense commodity.

Then, to supplement its own fleet, Matson "space chartered" ships of the

MAKAPUU LIGHT HAWAII MOST IMPORTANT ON THE PACIFIC

Isthmian Line, such as the S. S. Mobile City and the S. S. Steel Voyager, for emergency freight service from the West Coast to Hawaii.

Next, Matson reorganized its entire fleet, switching vessels to the most important cargo centers. Twelve ships were hurried from the East Coast to the important Pacific area. The 5500-ton freighter S. S. Manini, was assigned to transport materials to Midway Island, where a new airbase and submarine base were being rushed to completion.

As soon as they were ready, three of the new freighters, Hawaiian Planter, Hawaiian Shipper, and Hawaiian Merchant, were rushed into service for Australia and South Sea ports en route to meet our Government's demand for strategic chrome ores from New Caledonia, and for Australian wool and other defense materials important to National Defense.

Terminal Facilities

So much for the work with ships. But ships at sea depend upon what's done on shore. Docking and terminal facilities play a leading part in speeding vast volumes of cargo. To meet congestion occasioned by National Defense, terminal facilities had to be more than doubled! For instance, in San Francisco, Piers 36 and 50-B were leased outright, and many others were made available for emergency congestion.

Not only more dock space had to be provided, but new methods of handling the varied cargo set up. This was necessary, because of the unusual kinds of shipments, such as road-graders, armaments for land defenses, and other unusual and bulky freight. Furthermore new methods of handling cargo were necessary for quicker handling, so as to load and speed ships out of port on their way with their precious cargo as rapidly as possible.

For the same reason, to keep the ships at sea, even repairs to these vessels must be made in minimum time. So, the necessary facilities were improved, and work proceeded "around the clock." Even though eighteen hours of the twenty-four are "overtime," the work must go on, for ships in port mean cargo waiting.

Increase in Personnel

But more than ships, terminals, docks and machinery were needed. People were needed, too. A comparison of Matson's payrolls for the first six months of 1939 and 1941 will make clear how many more people the company needed in its employ to speed all this National Defense activity. Payrolls to shoreside personnel show an increase of over 19 per cent! Payrolls to ship personnel, 37½ per cent! Payrolls to stevedores, just under 99 per cent! Here is an increase, in all payrolls, averaging almost 48 per cent!

While this 48 per cent increase in payrolls in two years is an obviously important item in the cost of Matson's new operation, it is also obviously only a small part of the cost of the building of new ships and the reorganization of the company's services to meet the national emergency.

Now, it will be interesting to check the results of all this necessary upheaval undergone by the Matson Line. What we see is streams of ships flowing steadily from West Coast ports out across the Pacific. Their decks are piled high with trucks, tractors, and heavy machinery; their holds filled with cargoes of rice, flour, cereals, canned milk, all kinds of canned foods; their refrigerators lined with meats, fresh fruits and vegetables. They are part of the 880,000 tons of cargo Matson ships have carried to Hawaii, during the first six months of 1941, actually within two shiploads of the total carried for the entire year of 1939! On this basis, Matson expects to transport over 1,750,000 tons in 1941, over twice the amount for 1939!

Look again, and we see lumber. During these same first six months of 1941, ships in the Northwest service shuttled over 20,000,000 more board feet of lumber to Hawaii than during the whole previous year!

Because of their increased refrig-

erator space, Matson ships have been able to meet the unprecedented demand of the new defense personnel in Hawaii for refrigerated cargo, especially for frozen meats.

At the same time, Matson ships carried other important cargo. Its four swift passenger liners, besides stowing valuable fast freight in their holds, carried thousands of people. These passengers were not alone just the normal tourists to Hawaii. They included thousands of defense workers, Army and Navy officers, their wives and families for whom the Government requisitioned accommodations. Altogether, during the first six months of 1941, with the augmented rush to the Islands in full swing, these great liners carried approximately 37,000 people to the Islands, nearly as many as for the entire pre-defense year of 1939!

Only the most skilled planning could have accomplished this task. True, owing to Great Britain's deeper involvement in the war and certain restrictions placed on pleasure travel of British subjects, there had been a 3000 drop in the number of passengers over Matson's Australian route in 1940. But the mid-summer travel peak of 1941 lay ahead, in addition to the onrush of defense workers to the Islands. So, to meet the emergency, Matson shifted its South Pacific schedule and thus added five extra sailings to the regular schedule from California to Hawaii, for July, August and early September, increasing passenger space approximately 50 per cent by this adjustment alone!

Not only were these exigencies met, but others of paramount importance to the nation were met also. For instance, when a critical situation arose and stranded hundreds of Americans in the Orient, there was a sudden, desperate demand for ships to evacuate these nationals. The Government commissioned the Matson Line to this important task, and it acted promptly. Furthermore, the line rendered this valuable service to the Government, with no impairment of its regular services to strategic defense centers elsewhere in the Pacific.

Now, one of the most interesting facts in connection with all this vast movement of cargo and people is that it has been accomplished with only the addition of three new ships to the Matson fleet proper. Of the four freighters laid down at the beginning of the reorganization, only the three assigned to the Australian service were delivered. Owing to an acute shortage in naval auxiliaries, the Navy took over the fourth freighter, S. S. Hawaiian Packer, before it was completed.

The significant fact is that the task assumed by Matson was completed within its own organization. And this leads to the final, and probably the most significant result of Matson's new order in the Pacific, namely, the increased number of direct sailings from West Coast ports to Hawaii.

During the first six months of 1939, there were 39 direct sailings from San Francisco. For the same period in 1941, there were 55! From Los Angeles, during this half-year period in 1939, there were 3 direct sailings. In the 1941 half-year period, there were 18! The same comparison shows an increase in sailings from Northwest ports from 21 to 29! Here is an increase in total direct sailings from the West Coast to Hawaii from 63, in 1939, to 102 in the first six months of 1941.

To say the least, such an accomplishment as this staged by the Matson Line is encouraging. It is doubly so, when it is considered that it has met all the abnormal requirements of National Defense without, at any time, a serious threat to the vital requirements of Hawaii. Significantly it has been an evolution which has equipped the Matson Line adequately to cope with the emergency demands of the present and the future as a regular procedure.

Naturally, such an upheaval as that occasioned by all this unprecedented defense activity has been attended by some temporary inconveniences, as for instance, in the matter of certain luxuries and non-essentials. These were to be expected, but even they have been negligibly few, to be regarded as only reasonable concessions to the paramount issue of the nation's total defense.

What this single steamship line has been able to accomplish, merely follows the familiar pattern of the best traditions of the American merchant marine in the face of national emergency. An unprecedented demand for cargo and passenger space has been met, with characteristic efficiency. True, this emergency transcends anything in our past history, but so did former emergencies frequently transcend their predecessors, and they also were met with characteristic intelligence and determination.

Here, on our Pacific front, our merchant marine has again risen to the occasion. In the light of this performance it appears obvious that our American merchant marine is decidedly on the job.

Newest Ship for Training American Sailors

United States Maritime Service Steamer American Sailor dedicated at Hueneme, California

On August 30, Hueneme, the port of the thriving city of Oxnard, California, was the scene of an interesting ceremony at which the new United States Maritime Service training ship American Sailor was dedicated for her service at the Point Hueneme training school for merchant seamen.

Officiating at the dedication rights were: Maritime Commissioner Captain Edward Macauley; Jos. F. Marias, president of the State Board of Harbor Commissioners (representing the Governor of the State of California); E. C. Mausshardt, Pacific Coast representative U. S. Maritime Commission; Telfair Knight, director of the U. S. N. C. training division; M. E. Crossman, cadet training instructor, Pacific Coast district U. S. M. C.

Commissioner Macauley made an excellent dedication address.

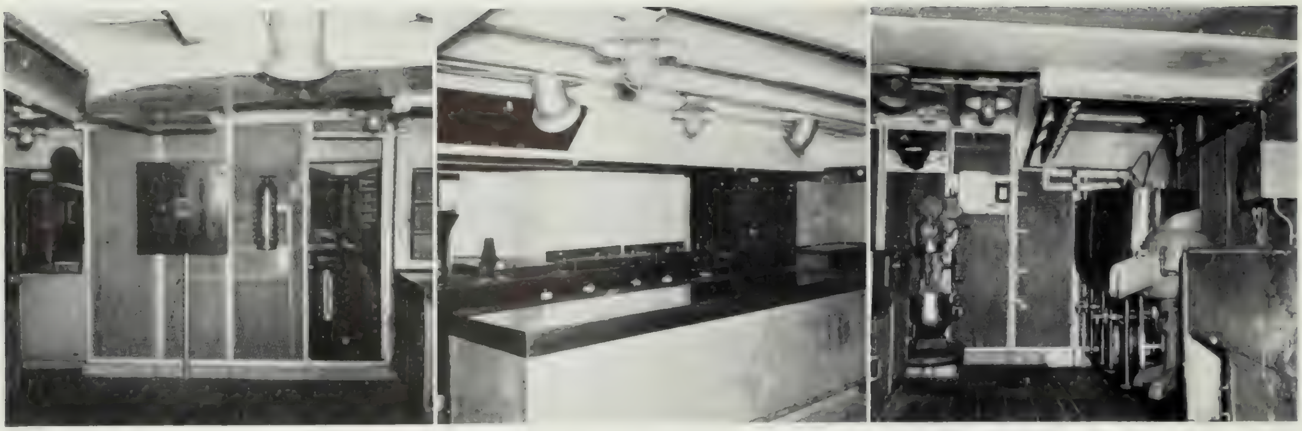
American Sailor is a rebuilt cargo carrier. She was the Edgemont, a Shipping Board 8800-ton type built in 1919 at Seattle. About a year ago she was turned over to the Baltimore plant of the Shipbuilding Division of the Bethlehem Steel Company for reconstruction at a cost of $1,644,000.

Her principal characteristics are:

Length B. P.	409′6″
Beam molded	54′
Depth	37′9″
Draft	20′1½″
Propulsion power	2500 shp
Speed	11 knots

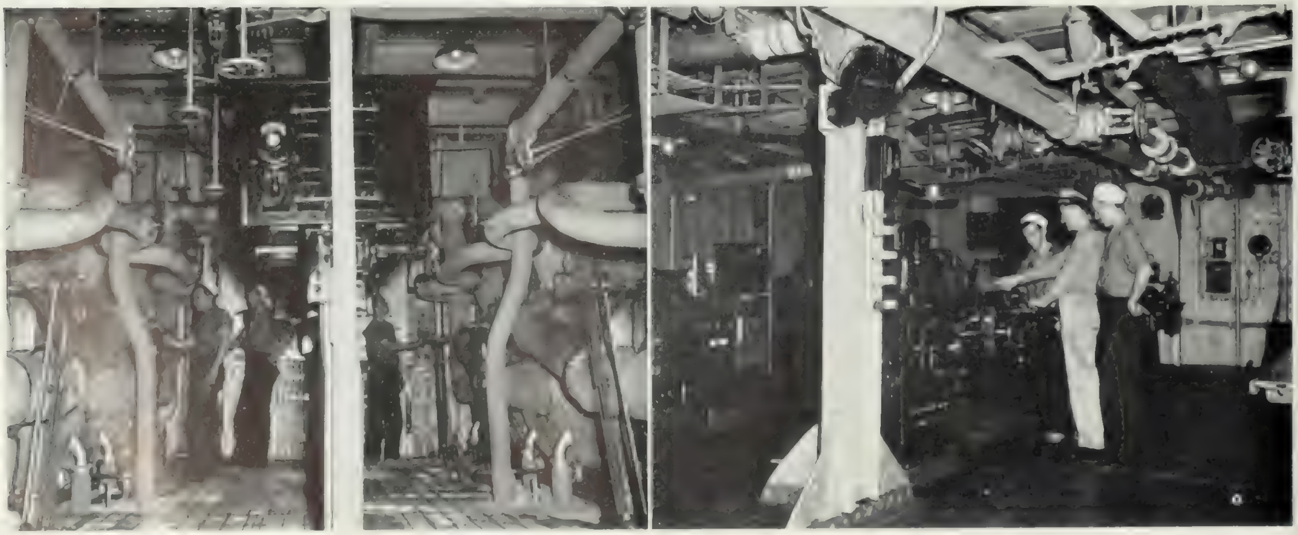
Four new transverse, watertight bulkheads were built unto the hull, giving her 11 bulkheads and 12 watertight compartments, or a two-compartment floodability.

The Maritime Commission training ship American Sailor



Up-to-date electric galleys equipped with every facility for catering to the husky appetites of American sailors

Sanitary lavatories and well-stocked pharmacy evidence concern for the conservation of health



The trainee has ample opportunity to study marine engineering

Her propulsion machinery was completely overhauled and renewed, where necessary. The main unit is a cross-compound, double-reduction geared turbine driving a single screw. At 90 rpm on the propeller shaft, this unit develops 2500 shp. Steam is generated in Scotch marine boilers fired by Dahl oil burners and operating at 210 psi.

In order to take care of the greatly increased cooking, refrigerating and ventilating electrical load, two 100-kw diesel engine driven generators were installed. These deliver 240/120 volt direct current to the ship's auxiliary power and light circuits. The switchboards are interconnected so that any failure of these generators automatically starts and transfers the load on certain emergency circuits to a diesel emergency generating set of 75-kw capacity located on the shelter deck.

Very elaborate fire proofing, fire detection and fire extinguishing systems are installed.

Galleys and pantries are equipped with the most modern electrical equipment.

As will be noted from the pictures herewith, American Sailor has fully equipped: hospital; dentist office; class rooms; auditorium, equipped with stage and projection booth for sound movies; shops of various types for training machinists, welders, blacksmiths and carpenters; laundry and dry rooms; tailor shop; barber shop; and a large evaporating plant with a daily capacity of 104,000 gallons.

It will be noted that the hull has been transformed by the installation of a flush shelter deck, and a new stack of more generous proportions. The Coast Guard color scheme is used so that both exterior and interior of hull are generally white. The handsome insignia of the United States Maritime Service adorns both sides of the stack.

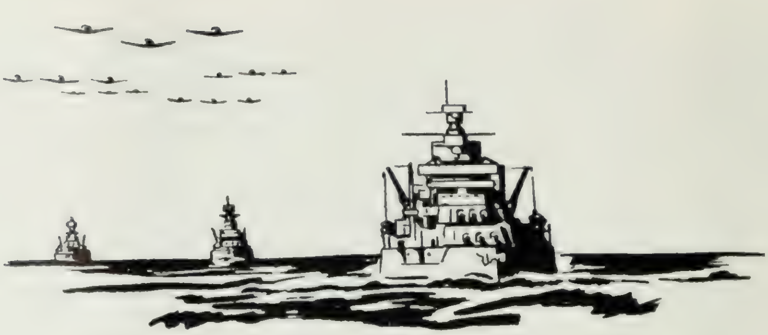
The 'tween deck and superstructure spaces are elaborately fitted with comfortable living accommodations for 235 men. The regular crew is approximately 75, including a staff of instructors and a number of cadets. This leaves room for 160 to 165 trainees.

The addition of this training vessel to those already in the service gives an annual capacity for 6000 trainees graduated from three-month courses of intensive training in both theoretical and practical seamanship.

The training ship is equipped with standard and motor lifeboats hung on various types of davit for training purposes. The trainees above are inspecting lifeboat equipment

Above: An office of one of the faculty

At right: Office of the ship's dentist



BUILDING *America's* *Two-Ocean Fighting Fleet*

General Electric all-out Defense Effort

The commissioning of the U. S. S. North Carolina on April 9, five months ahead of schedule; the commissioning of the U. S. S. Washington on May 15, six and one-half months ahead of schedule; the launching of the U. S. S. South Dakota on June 7, four months ahead of schedule—these were events clearly indicating the seriousness of America's all-out efforts for defense. These three great battleships are probably the most powerful machines of war ever built by man. The fact that three such ships have been launched or commissioned well ahead of schedule and within a period of three months, and that a fourth, the U. S. S. Massachusetts, will soon be launched, is a token of the United States' determination, in spite of all obstacles, to have two battle fleets available, one for use in the Atlantic and one for use in the Pacific. General Electric is proud of its important part in the great task of building these and many other vessels for our two-ocean Navy.

Building a battleship is an all-American enterprise. It draws upon most of the country's natural resources and upon almost every branch of the nation's industry. The normal demands placed upon G. E. production facilities by the orders for propulsion and other equipment for even a single battleship are substantial. In the case of equipment for the North Carolina, the Washington, the South Dakota and the Massachusetts, these demands were decidedly abnormal. Production schedules that were unheard of in the past years of manufacturing history had to be met in order to permit delivery of the vital organs for these new battleships without delays that would hold up their commissioning. Plants at Lynn, Mass., and at Schenectady, N. Y., had to call on their most experienced men to revise production plans to meet these new demands—but they were met, and well within the time allotted.

Since the turn of the century, General Electric has cooperated in the development of American naval power. More than 45 years ago, the first important electromotive equipment was installed on a U. S. warship—the cruiser Brooklyn—and this equipment, a system of motors and control for operating gun turrets, was installed by General Electric.

At that time many authorities, including both naval officers and electrical engineers, had grave doubts of the superiority of electrical control over the steam turret operation then in use.

The installation of motors and controls to turn the turrets on the Brooklyn marked the real beginning of the use of electrical power apparatus on naval vessels, and from that time on electricity was to play an increasingly important part in the operation of Uncle Sam's fighting ships.

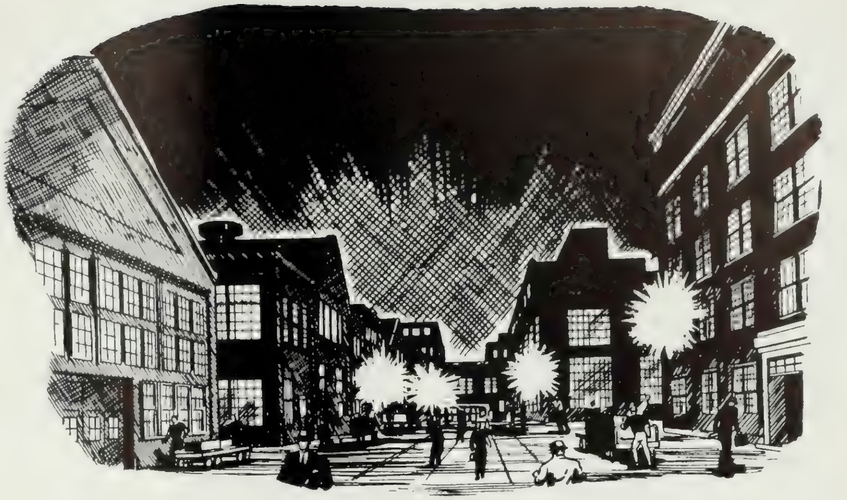
The logical outgrowth of the electrically-operated gun turrets on the Brooklyn is the modern electrically-equipped battleship, as represented by the North Carolina, the Washington, the South Dakota or the Massachusetts. Such a vessel is literally a floating powerhouse, generating enormous amounts of electricity for use in the entire vessel; running its pumps; operating its turrets, hoists and winches; and turning, elevating, aiming and firing its guns.

The story of the first application to turbine-electric ship propulsion is dramatic and absorbing. It begins in 1909, with the faith, vision and confidence of W. L. R. Emmet, a General Electric engineer, in the possibilities of turbine-electric drive for large vessels. Mr. Emmet was, even at that time, world-famous for his work on land steam turbines and electric generating machinery.

The size and power requirements of the battleship and other large naval vessels made these ships a logical choice upon which to fix his attention.

First Electric Drive

The first trial of turbine-electric drive for a naval vessel was made for the collier Jupiter, one of three then under construction.

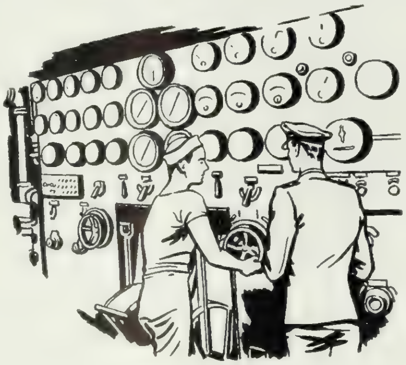


There are not enough daylight hours for the task

After repeated tests, the enthusiastic reports made by the inspecting officers were accepted by the Navy Department.

On the basis of its experience with the Jupiter, the Navy changed its plans for the drive of the battleship New Mexico, then building.

So, in 1917, the New Mexico, 32,000 tons of powerful, electric-driven fighting machinery, was launched. Electric motors also operated the steering gear, boat cranes, winches, capstans, refrigerating system, laundering machines, water pumps and oil pumps; they raised anchors, revolved turrets, hoisted ammunition, compressed air, and turned the fans and blowers; they supplied telephone systems, operated the battery of searchlights, and illuminated the entire ship.



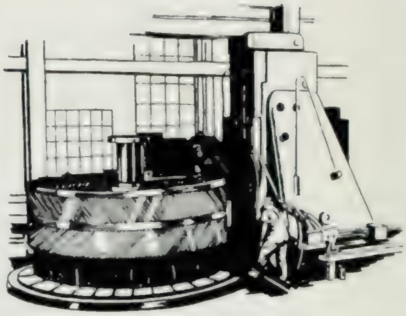
Control stand of a Navy power plant

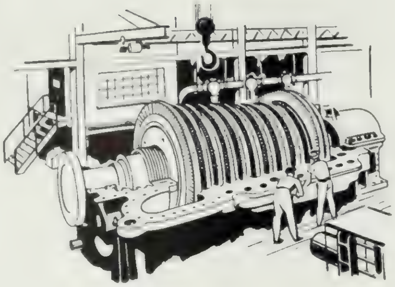
In bids submitted on a competitive basis, the General Electric Company won the contracts for the propulsion equipment for the North Carolina, the Washington and the South Dakota, as well as for the Massachusetts, which will be launched some time this year.

In the middle of 1940, with an expanded production schedule in operation, and with work progressing in accordance with that schedule, the Government announced its plans for increasing naval facilities to provide a complete two-ocean Navy. To do its part toward speeding up this program, and in anticipation of further demands upon facilities, General Electric again revised its production schedules. This meant a very drastic revision of engineering and manufacturing plans — a complete change - over from the methods and facilities that had previously seemed to be fully adequate. Turbine production was practically tripled, putting machine tools and other manufacturing equipment on a 24 - hour - per - day schedule. Hundreds of additional workmen were employed, trained and put to work. Huge expenditures were made to expand production facilities at the Erie, Lynn and Schenectady Works. Of special significance in the job of increasing speed on naval equipment production was the voluntary foregoing of vacations by many G. E. employees.

The battleship—an example of modern engineering progress—a symbol of sea power

Left: W. L. R. Emmet, G. E. engineer and father of turbo-electric propulsion for battleships. Below: The low-pressure rotor of a marine turbine. Right: Hobbing a large marine reduction gear





Magnitude of Task

The tremendous power required to propel a battleship of the North Carolina class is supplied by four sets of propulsion turbines and as many sets of reduction gears. In the time allotted to the task, it would be physically impossible for General Electric alone to turn out all the turbines and accompanying sets of gears required by the present program. The Navy Department, however, has found the G-E turbine designs to be so desirable that they are being used for turbines made in other factories.

Construction of a single turbine of the size now in operation in the U. S. S. North Carolina requires the use of between 600 and 700 drawings by designing engineers, the services of more than 4000 skilled engineers and workmen, and the machining of many tons of steel, either in G. E. plants or in those of subcontractors. The reduction gears require the machining of parts of tolerances of one ten-thousandth of an inch.

Nor does General Electric's job end with the manufacture of one of these units. After being assembled, each unit is set up and thoroughly tested, then dismantled and transported to the shipyard.

Engineering Supervision

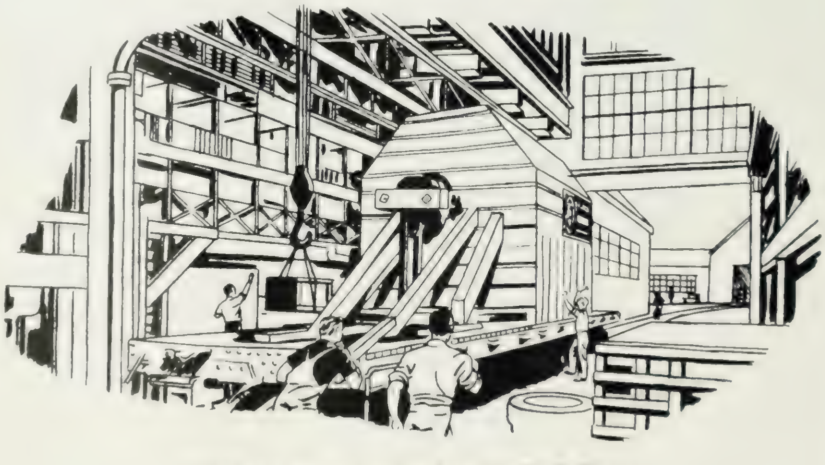
Along with the dismantled apparatus go G. E. engineers to supervise installation. In the case of battleships of the North Carolina class, the propulsion equipment has to be installed before the hull is launched. After the apparatus has been installed and the launching is completed, G. E. engineers go aboard to supervise installation of much of the electric auxiliary equipment that performs the multitude of services necessary to the proper operation of the ship. These and similar operations must be repeated again and again a hundred times in the months ahead.

In the 40 years since it started, the central-station industry has built up in this country an active steam-generating capacity of about 41,500,000 horsepower. Now, General Electric has been asked to deliver, in something more than three years' time, an additional quantity of steam turbines for all purposes, amounting to more than a third of this present capacity.

General Electric orders on hand at the present time call for the building of propulsion equipment for a large number of ships and furnishing the auxiliary equipment for these and many other vessels. This equipment is for battleships, cruisers, destroyers, aircraft carriers, net layers, mine layers, tenders and repair ships.

Multiply the efforts in producing the drive and auxiliary equipment for just one vessel hundreds of times, crowd this effort into three years, and one gets some idea of the task undertaken. General Electric is passing through the greatest period of expansion it has ever attempted in answer to the Navy Department's call for greater production of electric equipment for ships.

General Electric's resources and the specialized talents of its personnel are dedicated to meeting the needs of the U. S. Navy. When the requirements call for deliveries in advance of dates scheduled, every possible effort will be made to see that such delivery dates are met. It is to this end that General Electric is directing its ability, energy and determination.



Shipping a marine turbine from the G. E. Works

A happy launching foursome: Read Admiral Emory S. Land, the keynoter; Mrs. E. S. Land, the sponsor; Sir Arthur Salter, the purchaser; and Henry J. Kaiser, the builder

A Vanguard is Launched

Above: Ocean Vanguard's bow, poised for her chistening, proudly vaunts the flags of the great democracies

At right: A tug gently nudges the new vessel over to the outfitting dock

Ocean Vanguard is the first to be launched of 60 vessels building in America for the British Government. She is a product of the Todd-California Shipbuilding Corporation, Richmond, California, who have a contract for 30 such ships, which they will launch at the rate of one every fifteen days or better. Ocean Vanguard is about two months ahead of schedule

The American Merchant Marine

by J. Lewis Luckenbach
President, American Bureau of Shipping

With the great increase in the number of ocean-going vessels being built in this country, the average size of vessels being built to American Bureau classification has naturally increased. The average tonnage of the 92 vessels, totaling 283,115 gross tons, building to Bureau classification on January 1, 1938, was 3077 gross tons. The average tonnage has gradually increased so that as of July 1, 1941, it has more than doubled, reaching 6590 gross tons. Along with the growth in average tonnage, the number of vessels under construction or contracted for to American Bureau of Shipping class is nine times greater than the comparable figure of three and one-half years ago. The corresponding gross tonnage of these vessels is nineteen times greater.

These figures are quoted in order that some idea may be had of the large amount of work being handled by the Bureau's staff, necessitating expansion of personnel in all departments and offices throughout the country. Table I graphically illustrates the prevailing situation.

J. Lewis Luckenbach
President, American Bureau of Shipping

In my report at the annual meeting in January, I indicated that about 100 seagoing vessels would probably be added this year to our merchant marine. Since then, schedules have been speeded up in all our shipyards and we have embarked upon the building of Emergency Type vessels. With this change in program, we should now produce this year 110 to 115 seagoing merchant vessels, totaling close to 1,000,000 gross tons. In the first six months of this year, 40 vessels in this catagory of 326,789 gross tons were completed, so that in the remaining six months 65 per cent of the entire year's production will have been turned out, an indication of the general speeding up of schedules in shipyards. To date, 54 seagoing merchant vessels of 434,680 gross tons, have been launched, which is at the rate of two a week. In 1940, 53 seagoing vessels of 444,703 gross tons were built, while in 1939, only 28 vessels of 241,052 gross tons were added to the merchant marine; so that our shipyards should deliver 100 per cent more vessels in 1941 than in 1940 and 40 per cent more than in 1939.

As of July 1, contracts were in existence for the construction of 751 seagoing merchant vessels for private interests, the British Government and the Maritime Commission, totaling about 6,000,000 gross tons and employing propelling machinery which will develop approximately 3,500,000 horsepower. Since then, the Maritime Commission has announced a further expansion of their program, contemplating the construction of 566 additional vessels. Of these, 541 will be in the seagoing merchant ship category, making a total of 1297 such vessels under contract, and adding approximately 9,650,000 gross tons to our merchant marine. This construction program will place the United States far in the lead as a producer of merchant tonnage and the addition of this new tonnage to our documented seagoing merchant marine would result in more than doubling our pre-war (September 1939) merchant fleet.

As to the cost of this vast shipbuilding program, while complete information is not yet available, it is interesting to note that since January 1 of this year the Maritime Commission has awarded, under the emergency ship

I. Vessels Under Construction or Under Contract to American Bureau of Shipping Classification

	No.	*Gross Tons*	*Average Gross Tonnage*
January 1, 1938	92	283,115	3,077
July 1, 1938	119	476,560	4,005
January 1, 1939	149	583,830	3,918
July 1, 1939	122	630,340	5,167
January 1, 1940	238	1,167,390	4,905
July 1, 1940	287	1,528,260	5,325
January 1, 1941	283	1,551,878	5,484
July 1, 1941	829	5,462,895	6,590

program, shipbuilding contracts, contracts for expansion of existing shipyards and the creation of new yards to the value of approximately $800,000,000, bringing the total of all such awards to the figure of $1,863,350,000. The cost of the new awards of 566 vessels soon to be made is estimated at $1,246,650,000, making a grand total of $3,110,000,000. To this must be added the value of private shipbuilding contracts for seagoing vessels in existence today, approximately $200,000,000.

As to the present status of the American merchant marine, the number and gross tonnage of documented seagoing vessels over 2000 gross tons has steadily declined since the start of the war in Europe, the principal reason for this being the sale and transfer of tonnage to foreign flags and to our Navy and Army Departments. While 106 seagoing merchant vessels of 872,647 gross tons have been built since September 1939, the number of such vessels now documented is 1136 of 6,815,304 gross tons, a reduction of 197 of 1,261,575 gross tons. The average age of our documented seagoing merchant fleet is 20 years. Table II illustrates the present status of our passenger, cargo and tanker fleets.

II. Status of American Merchant Marine
Vessels of 2000 Gross Tons and Over—Excluding Great Lakes

	Passenger		*Cargo*		*Tanker*		*Totals*	
Date	*No.*	*Gross Tons*	*No.*	*Gross Tons*	*No.*	*Gross Tons*	*No.*	*Gross Tons*
Sept., 1939	156	1,306,999	811	4,078,774	366	2,691,106	1,333	8,076,879
July, 1941	112	748,853	677	3,506,516	347	2,559,935	1,136	6,815,304
Reduction	44	558,146	134	572,258	19	131,171	197	1,261,575

It is interesting to turn our minds back to early in 1917, when the cost of construction of merchant tonnage was between $60 and $70 per deadweight ton, which rapidly increased from then on to around $220 per ton. The cost of tonnage of the high-class, speedy vessels of the C-2 and C-3 types has been around $240 per ton, and for the "ugly duckling" type around $160 to $170. It is interesting to note that on the recent tenders for the smaller coaster type vessels for the Maritime Commission the bids have averaged over $400 per ton.

Today we are reaching a point where the possibility of turning out rapidly and in quantity the most desirable types of machinery and hull construction is limited, and it may be desirable for certain services to revert to such expedients as the concrete ship, if only to save steel.

The additional program will call for further expansion of our shipbuilding facilities. Were it not for the adoption of ship welding, the tremendous expansion in the short period of time would not have been accomplished. The application of welding has even facili-

(Page 74, please)

RECAPITULATION OF CONSTRUCTION CONTRACTS IN EXISTENCE AUGUST 1st, 1941
AS TO TYPE AND PROPELLING POWER

Type	No.	Gross Tons (Est.)	Steam		Turbo-Electric		Diesel		Diesel Electric	
			No.	H.P.	No.	H.P.	No.	H.P.	No.	H.P.
Cargo	582	4,117,240	537	2,042,100	—	—	45	228,350	—	—
Passenger	23	205,200	19	160,800	—	—	4	34,000	—	—
Tanker	140	1,424,660	58	428,500	76	452,000	6	31,900	—	—
Tug	29	5,515	4	4,000	—	—	23	18,540	2	2,000
Towboat	5	1,235	—	—	—	—	5	5,960	—	—
Ferry	2	1,650	—	—	—	—	1	800	1	950
Mine Layer	8	6,560	8	9,600	—	—	—	—	—	—
Trawler	7	2,090	—	—	—	—	7	4,475	—	—
Survey Vessel	2	1,480	1	2,000	—	—	1	300	—	—
Hopper Barge	17	6,375	—	—	—	—	—	—	—	—
Oil Barge	74	36,705	—	—	—	—	—	—	—	—
Cargo Barge	54	23,020	—	—	—	—	—	—	—	—
Dredge	1	1,800	—	—	—	—	—	—	—	—
Yacht	1	40	—	—	—	—	—	—	—	—
Totals	945	5,833,570	627	2,647,000	76	452,000	92	324,325	3	2,950

Self-Propelled Vessels — 798 — 5,765,630 gross tons — 3,426,275 horsepower.
Non-Propelled Vessels — 147 — 67,940 gross tons.

From Bulletin American Bureau of Shipping

Marine Lubrication

Some Useful Information Compiled by the Lubrication Engineers, Standard Oil Company of California

Ships, ships and more ships is the urgent demand placed upon the shipbuilding yards of the United States today. Merchant shipbuilding, aside from Naval Construction is now racing against time to keep pace with British ship losses and to balance, if possible, air raid damage to British shipyards.

The tremendous responsibility of speedy mass production of ships not only affects the ship construction yards but numerous other industries upon which the responsibility rests for the fabrication and manufacture of material and equipment necessary for construction and operation. After construction and equipment of vessels are completed comes the equally tremendous responsibility of transportation operations.

Marine operations are distinctly different from land transportation. On land, a lubrication failure results at most only in a temporary annoyance and expense. At sea, however, such failures become greatly magnified, not only because of the resultant delay but more especially of the possible danger to ship, crew, passengers and cargo. Reliability of marine transportation service means much and depends more upon lubrication than upon any single factor other than fuel. Poor and faulty lubrication wastes fuel, reduces speed, increases repair bills and shortens the life of the machinery necessary for ship operation.

No specific lubricant or lubricating method is universally applicable to the several types and designs of marine machinery. There are, however, certain fundamental principles of good lubrication which, if followed, consistently and conscientiously lead to higher operating efficiency, freedom from breakdowns at sea, reduction of non-revenue time in port and necessarily the lowering of overall expense.

Geared Turbines

In modern ships, the main propulsion units are either double reduction geared steam turbines or diesel engines. The lubrication of modern marine turbines, due to high steam pressures, temperatures and speeds has been given extensive consideration by oil refiners and turbine manufacturers. Lubricating oils for such equipment must perform satisfactorily over long periods of time in full pressure and gravity circulating systems. As a result of these studies, fairly rigid specifications on marine turbine oils have been set up, stipulating that these oils be well refined mineral oils having a rapid water separation rate, a low oxidation rate, low neutralization number, low pour point, low carbon content, and be within the viscosity range of 220 to 260 seconds Saybolt Universal at 120° Fahrenheit, or 185 to 205 seconds Saybolt Universal at 130° Fahrenheit.

Auxiliary turbines units used in emergencies for light and standby service are usually connected to the main propulsion unit circulating oil system. However, where such auxiliary units have their own circulating oil system, a turbine oil comparable to the main unit oil, but lighter in viscosity, 135 to 145 seconds Saybolt Universal at 130° Fahrenheit (280/325 at 100° F.) should be used.

Diesel Engines

Diesel engines, due to their rapid development and increased efficiency, are being used more and more in modern vessels as propulsion power units as well as auxiliary power units. In this rapid development lubrication has played an important part. Highly effective lubrication under difficult and contradictory operating conditions is necessary for efficient and reliable diesel operation.

In the modern diesel engine, high rubbing speeds in power cylinders are encountered as well as intense heat which causes troublesome carbon formations around piston rings, on piston heads and in combustion chambers; with piston pins and cross-head pins there are high bearing pressures combined with a relatively slow oscillating motion; on crank pins there are high bearing pressures and high speeds; in diesel air compressor cylinders (on air injection engines) there is moisture. Upon the surfaces of all these parts there must at all times be a protective film and seal of lubricant for otherwise the engine would misfire, lose power, waste fuel, wear rapidly, and in the extreme cause failure at sea. For many years straight mineral oils were used with fair success, but with the advent of later diesel design and higher speeds, these oils were not adequate.

The responsibility of the development of suitable oils to meet these diesel operations naturally fell upon the oil refiners, and one major oil company, the Standard Oil Company of California, developed the first successful additive or compounding to be added to mineral oils. This diesel engine lubricating oil is marketed under the brand name RPM Delo in the SAE 10, 20, 30 and 40 grades.

Today, compounded diesel engine oils are the answer to the former problem of carbon and gum troubles experienced in diesel cylinders, in addition to accomplishing a definite reduction in cylinder liner and ring wear. Some of the additives now used are only oxidation inhibitors which improve the natural stabilities of the base oil stock and the life of the lubricant is thereby improved. Others, of which RPM Delo is an outstanding example, have the added superiority of imparting to the oil other essential lubrication characteristics for this particular service.

These compounded oils are marketed in various viscosity ranges or SAE grades so as to efficiently handle all types and makes of diesel engines.

Reciprocating Steam Engines

Although steam turbines and diesel engines predominate in newer marine installations, the reciprocating steam engine even now holds the spotlight of importance due to the sheer force of numbers of vessels still propelled by this type of equipment. These steam units are usually of the vertical multi-expansion type operating, condensing or sometimes non-condensing with either saturated steam or superheated steam.

With engines running condensing and under saturated steam conditions, it is not usually desirable to supply oil directly to the cylinders as oil carried in the exhaust steam to the condensers may find its way with the feed water into the boilers. Under these conditions, the moisture in the steam must be relied upon to provide lubrication of the steam cylinders.

With superheated steam, as moisture is absent, it is necessary to provide oil lubrication to the cylinders. Such an oil must be of properly refined steam cylinder stock, uncompounded, and of relatively high viscosity (170-200 seconds Saybolt Universal at 210° F.). This same oil is used for swabbing of piston rods and valve rods to prevent scoring and to lubricate the rod packing. Where saturated steam is used, under condensing conditions, a lighter bodied, uncompounded mineral cylinder stock is advocated for piston and valve rods (140/160 seconds Saybolt Universal at 210° F.).

With steam units operating under saturated steam conditions, non-condensing or jet condensing, the danger of contamination of the feed water by oil does not exist and a compounded cylinder oil of 140/160 seconds viscosity Saybolt Universal at 210° F. (5 to 15% compounding dependent upon the moisture conditions of the steam) is preferable in order to resist the washing action of the moisture in the steam. This same oil is utilized for the piston rods and valve rods.

Lubrication of the external parts, such as crosshead guides and pins, crank pins, eccentrics, valve gears, main bearings, reversing and jacking mechanisms, is usually accomplished by the use of a marine engine oil (700/1000 seconds viscosity Saybolt Universal at 100° F.) compounded with blown rape seed oil or other lather forming compounds (10% to 20%) to provide a friction-reducing film of lubricant on these parts in the presence of water. The worm gear drive of the jacking engine (if enclosed) usually requires an extreme pressure gear lubricant—SAE 140 grade. If this reduction gear is not enclosed, a lubricant tacky and adhesive in nature that will not drip nor throw off, is advisable.

Propeller Shaft

Next in importance to the main propulsion units is the lubrication of the propeller shaft or shafts transmitting the power of the main units to the propeller. These shafts are supported by tunnel bearings and equipped with bearings capable of absorbing the entire force or thrust of the water that results from the turning of the propeller. These thrust bearings are of various designs and because of the very important part they play, their operation must at all times be trouble free. Where lubrication of these bearings is accomplished by wick feed or bath lubrication, a compounded marine engine oil (mentioned above) is suitable.

With forced feed lubrication an extra heavy turbine oil (185/205 seconds viscosity Saybolt Universal at 130° F.) is suitable. Lubrication of tunnel bearings as well as the stern tube and outboard bearings is usually accomplished with the same type of lubricant as used on the thrust bearings.

However, these line bearings are sometimes designed for grease lubrication. In this case a grease of high emulsifying characteristics and hard consistency (tunnel bearing grease) is required.

Auxiliary Machinery

In addition to the foregoing vital equipment to be lubricated, consideration must be given to the auxiliary equipment necessary for ships' operations. External lubrication (bearings) of generator sets, electric motors, blowers, fans and pumps require an engine oil (non-compounded) of from 200/350 seconds viscosity Saybolt Universal at 100° F. Refrigeration equipment requires highly refined ice machine oils, having viscosities Saybolt Universal ranging from 150 seconds at 100° F. to 400 seconds at 100° F., dependent upon the type of refrigerant used and the operating conditions.

Of all the machinery aboard ship, that on deck is probably subjected to the worst conditions; yet, as much as any other marine machinery, it must operate smoothly and uninterruptedly when needed. The lubrication of these units is often more neglected than any other operation on board ship, yet this should not be the case. Periodic application of proper lubricants will save wear and tear on the machinery, speed up its operation and reduce noise.

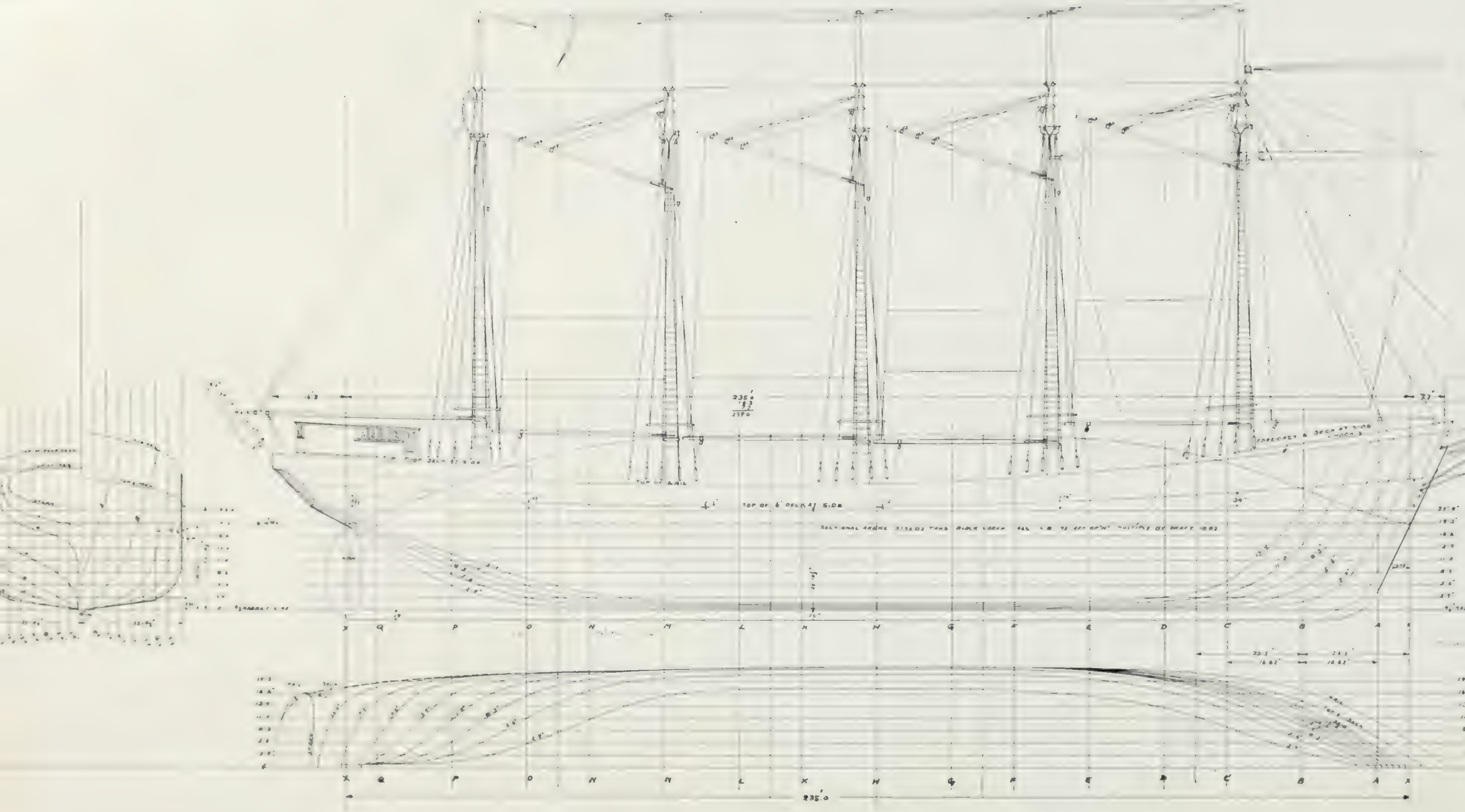
Windlasses, capstans, and winches are usually power-driven by either electric motors or steam engines whose lubrication requirements do not differ from those of similar engine room equipment. The reduction gear drives incorporated require, if enclosed, an extreme pressure fluid gear lubricant of the S.A.E. 90 or 140 grade, dependent upon climatic temperature conditions. Exposed gears require a lubricant having tacky, adhesive qualities which will protect against corrosion from sea and weather and withstand the loads and shocks imposed by severe service. Reduction gear bearings and other bearings may be lubricated with the engine room bearing oil or a good grade of cup grease where grease lubrication is adaptable.

Steering gear power units (electric motors or steam engines), as well as the reduction gears involved, require the same type of lubricant as noted for other similar deck or engine room equipment.

The hydraulic telemotor requires a fluid medium whose viscosity changes but relatively little with temperature. A highly refined stable mineral oil of high viscosity index and a pour point of at least 20° F. below zero is required. The viscosity of this oil at 100° F. will vary according to the manufacturer's lubrication recommendations for the equipment used. Some equipment requires an oil of 60/70 seconds viscosity Saybolt Universal at 100° F. and others require an oil having a viscosity Saybolt Universal at 100° F. as high as 300 seconds.

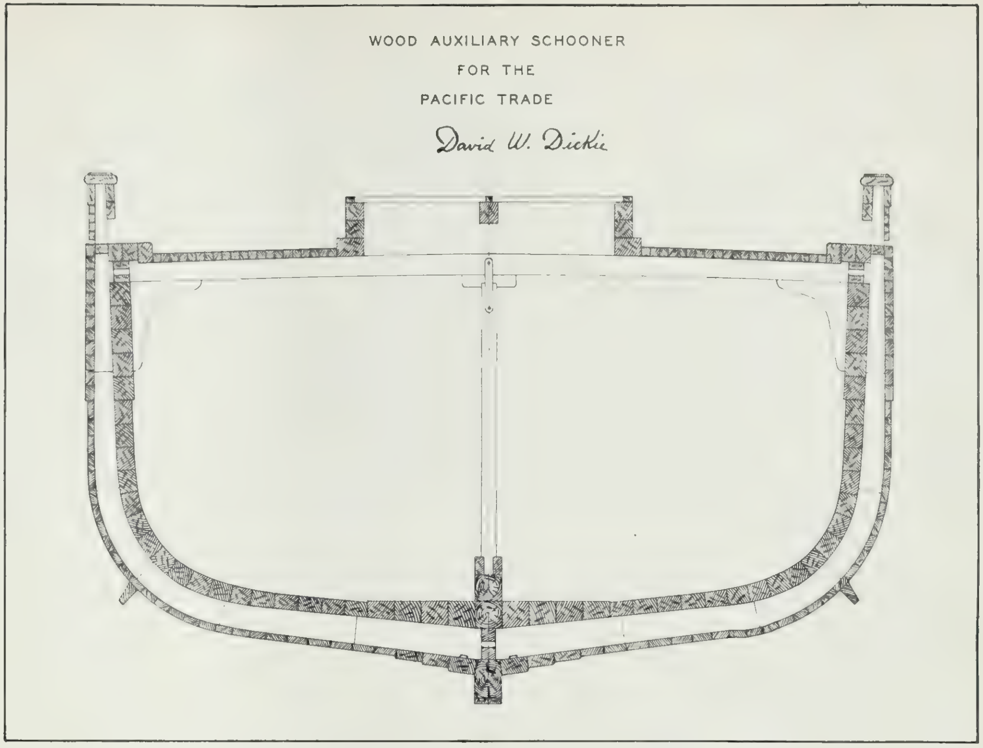
WOOD AUXILIARY SCHOONER
FOR THE
PACIFIC TRADE

David W Dickie



PROPOSED AUXILLIARY SCHOONER

by David W. Dickie



At present, and for some time in the future, there will be a demand for space between the Philippines and the East Indies, and the Pacific Coast. Due to the emergency, ships cannot be spared for the purpose. At the same time, there are shipyards and shipyard talent of many years' training and experience inactive on the Pacific Coast.

This suggested the preparation of the accompanying design of a wood auxiliary schooner that can be built for less money than is being paid for the steel vessels of a little greater carrying capacity. The cost of the steel vessels runs in the neighborhood of $473 per deadweight ton.

The data for fifteen of the most successful wood schooners were correlated and the known faults eliminated. The design was then changed to comply with the load line and other requirements and restrictions that have developed in late years. At first, it appeared best to eliminate the sails and put in full power but this involved making detail designs of machinery and boilers and supervising the building in small shops not now working on National Defense. As soon as it was demonstrated that this procedure was feasible, the machinery would be requisitioned for National Defense and the job would be in complete confusion.

The Classification Societies will assign the steamer load line to a sailing vessel provided she has sufficient auxiliary power to make a certain minimum speed. This is assigned after consideration of the size and type of vessel and provided she is built to class so there is full control of the strength. During World War I, the full steamer load line was assigned to a similar vessel after the speed was demonstrated by measured mile trials.

The midship section is based on similar sized vessels that have run successfully all through the depression without showing any weakness or requiring more than routine repairs. The rig is a result of considerable study. It is operated entirely from the deck, and, if necessary, the sailor can be sent aloft in a boatswain's chair.

Pacific Coast-Philippine Commodity Rates

	Eastbound
Lumber (hard wood) . .	$28.00 per thousand board feet
Sugar	21.50 per ton of 2240 pounds
Copra	15.00 per ton of 2240 pounds
Chrome ore	16.00 per ton of 2240 pounds
Pig tin	41.00 per ton of 2240 pounds
Rubber	26.25 per 50 cubic feet
	21.00 per measurement ton of 40 cubic feet
Hemp	4.10 per bale, 13 cu. ft., 279 lbs. per bale
	12.60 per measurement ton of 40 cubic feet
	Westbound
Lumber (fir)	28.00 per thousand board feet
Flour	25.00 per ton of 2000 pounds
Petroleum products . . .	18.50 per measurement ton of 40 cubic feet

The power is divided into twin engines, which brings the size of the units within the scope of the engine companies making workboat engines, all of which makes for simplicity and dependability and enables the engineers to be recruited from among the ranks of the motorboat operators.

The special arrangements for carrying a cargo of tin and rubber have been omitted from the drawings as the loading of wood vessels is an art known only to those familiar with the type.

Admittedly, the vessel cannot carry cargo as economically as a large steel vessel of commercial design. She will require 37 to 38 days to make the run to the Philippines and only carries about 2000 weight and measurement tons, depending on the stowage, or about 1500 thousand board feet of lumber.

The controlled freight rates on a few representative Philippine and East Indies commodities are given in table herewith.

If the rate-governing body will permit the vessel to get the best rate that can be negotiated between the shipper and consignee, the vessel should pay out during the national emergency.

News FROM THE PACIFIC NORTHWEST

by Daniel L. Pratt

As of August 15th

Portland Company Takes Over Two C-1s

By the middle of September, two more Puget Sound freighters, representing an investment of more than $4,000,000, will have been added to the Pacific fleet of carriers and will be breasting the swells of the Pacific in the service of the Pacific Atlantic Steamship Co. of Portland. One of these, christened Cape Cleare but renamed Oregon, after having her dock trials and speed tests early in August, has already taken on cargo for the East Coast; and the other, built as Cape Douglas and renamed Idaho, was to have been delivered to the new owners early in September. Built at the Tacoma plant of the Seattle-Tacoma Shipbuilding Corp., both are C-1-B diesel freighters of the same type as Cape Alava, Cape Flattery and Cape Fairweather, also built by this yard for the American Mail Line of Seattle. The Atlantic-Pacific Steamship Co., recently reorganized, has several subsidiaries, among them the States Steamship Co., and is composed of factors long known in the transportation field. The present officers are: S. F. Fleming, president and general manager; R. A. Nichols, first vice president; Donald Kerr, vice president, and Kenneth Robertson, secretary and treasurer. On the trial trip of the Oregon, on Puget Sound, the company was represented by Vice President Donald Kerr. Formal delivery of the vessel was made at Portland, her new home port.

B. C. Yards Doing Their Part With Defense Ships

Recent visitors to Vancouver and Victoria have been struck with the rapid progress shipyards in British Columbia are making in plant expansion and shipbuilding. In the Vancouver area, the yards have already turned out twelve Corvettes now serving on convoy and anti-submarine activity in the Atlantic. Several 10,000-ton freighters are in various stages of construction, two nearing completion. It has been so planned that the Vancouver ways will regularly have 12 of these necessary boats under construction. Four new mine layers have also been recently launched. At Victoria, both **Yarrows, Ltd.,** and the **Victoria Machinery Depot** will soon each have about 2000 men working. They are building Corvettes.

Oregon Yards Making Records

All of the Portland steel shipyards and several of the wood ones are taxed to entire facilities and making good progress on the work that has been awarded to them.

The new **Oregon Shipbuilding Corp.,** located on a site of 178 acres near the mouth of the Willamette River, have really gone to town, considering the short time they have been operating. With a contract for 43 vessels of the EC-2 Emergency type, this plant now have 11 ways in commission and will launch their first hull on September 20. As of August 16, eight keels had been laid, and within the following week three more were added, completely occupying the 11 ways. It is expected that a peak employment of 9500 men will be reached by November 1, and, from then on, the entire contract for the 43 boats will be rushed to completion, with more work probably to follow.

At the plant of the **Willamette Iron & Steel Co.,** keels for two big mine layers, to cost $13,000,000 each, were laid on July 12 and this contract will be rushed to the utmost. The company is also building 50 marine reciprocating-type, triple-expansion engines of 2500 hp each, to be used in the "Ugly Duckling" freighters, the complete power plants to cost $115,000 each.

The **Albina Iron Works at Portland** are operating four ways building 110-foot subchasers. **Commercial Iron Works,** which has its shipbuilding plant at the foot of the Ross Island Bridge in Portland, operating two shipways, have just finished four anti-submarine net tenders, all commissioned but one, and have the keels laid for four steel mine sweepers. They will go into full production on this latest contract by early September. Awarded them also is the conversion of the freighter M. S. Leme, seized from the Italians. They expect to complete this job in September.

At Astoria, the **Astoria Marine Construction Co.,** in addition to its large defense contract for four 135-foot wooden, diesel-powered mine sweepers, is also building a number of fishing boats, including trollers and the largest trawlers. The boom in the tuna fishing business since the price has gone from $130 a ton to over $300 at times this season, has caused a demand for every available type of fishing craft.

Kruse and Banks at Marshfield are also working to capacity on their order for 135-foot mine sweepers.

Oregon Builders Attend Bay Launching

A number of well-known shipbuilders from Portland went to San Francisco to witness the launching of the Ocean Vanguard, first of the ships completed on the coast for the British government, at the Todd-California plant at Richmond, California. The party included **Edgar F. Kaiser,** vice president and general manager of the

Oregon Shipbuilding Corp.; **Al Bauer,** chief engineer; **John Hallett,** hull superintendent; **William Smith,** chief hull inspector for the Maritime Commission, and **Charles Shea, Jr.,** administrative assistant.

Grays Harbor Shipyard Expands

The **Grays Harbor Shipbuilding Co.** has announced an expansion plan which includes four ways in which to build 136-foot vessels, three marine railways for repairing and converting vessels and three other ways for building ships up to 400 feet in length. One marine railway will be built before any of the construction ways, as the firm anticipates a rush of orders for repair and conversion work. If the yard is built to the ultimate capacity planned, it can handle ten ships at one time, three on the repair ways, four on the smaller construction ways, and three ships up to 400 feet on the larger ways.

Alaska Business Given Great Boost

The greatest and most striking development in Pacific Coast shipping has been the tremendous ship tonnage called for to supply the large Army and Navy bases in Alaska. The Army's shipments going to the air bases at Fairbanks and Anchorage have been taken care of largely by Army transports, but the material and men for the Navy bases at Kodiak and to Aleutian bases has been handled by the **Alaska Steamship Co.** In fact, the full facilities of all the Northern lines have been taxed to the utmost.

Now, to add a new climax to this shipping upsurge—already far above the volume of the Gold-Rush Days—comes an additional award to the **Siems-Drake-Puget Sound Co.,** contractors for the naval seaplane bases at Kodiak, Sitka and Unalaska, of a supplemental contract for $26,029,000 for additional facilities at these stations. This means an immense addition to the volume of freight and machinery which Alaska vessels will be called upon to handle during the coming two years.

This will be one zone where the Government can't afford to call off steamships to send them to Europe, or into any other service.

Seattle-Todd Drydock Assured

Assurance of the new million-dollar drydock, upon which construction is to be started immediately, was announced by **R. J. Lamont,** president of the **Todd-Seattle Drydocks, Inc.,** late in July. The announcement followed word of the approval of a loan of necessary money by the Defense Plant Corporation. The new dock will be 410 feet long, 90 feet wide over aprons and will have a lifting capacity of 5700 tons. It will be smaller than the yard's other two docks and will be used for smaller Navy vessels, such as destroyers. This new dock, according to Mr. Lamont, will make a well-balanced yard. It is expected to be finished soon after the first of the year.

Christened Cape Cleare but renamed Oregon, she is now in operation under the house flag of the Atlantic-Pacific Steamship Co. of Portland, Oregon

Marine Shorts

The Navy Department is planning to construct vast underground fuel depots for oil at Middle Point and Orchard Point, on the south shore of Rich Passage which leads from Admiralty Inlet, outer Puget Sound, to Port Orchard Bay, on which the Puget Sound Navy Yard is located. Work on these two fuel depots has been under way for about a year, but the real purpose and extent of the work was only revealed recently in testimony before the House Naval Affairs Committee by Read Admiral Ben Moreell, chief of the Bureau of Yards and Docks.

* * *

The **Tacoma Commercial Wharf and Warehouse** was leased recently by the **Archer-Daniel-Midland Co.,** for the storage of an estimated 1,000,000 bushels of wheat for the United States Government. Several months ago, the same firm leased the entire grain elevator facilities of the Port of Tacoma, which has a storage of 600,000 bushels. It is understood there is a shortage of bulk storage for wheat in many parts of the country.

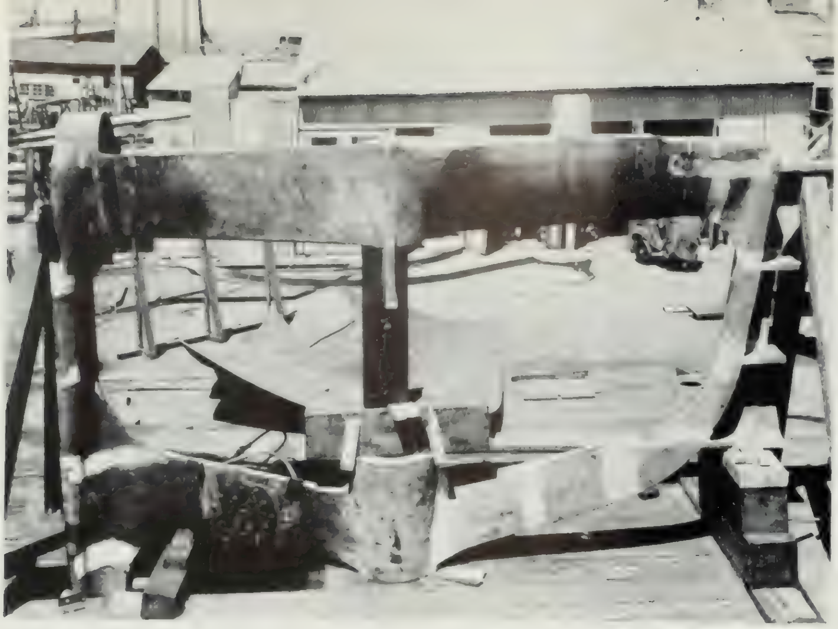
During the month of September, the **Lake Washington Shipyards** expect to launch the new $1,250,000 steel survey ship Pathfinder. The hull is practically completed but because of delay in delivery of the vessel's turbines, she will probably not be ready for commission for some months. Pathfinder is 220 feet overall, 10 feet longer than Explorer, built by the same company. According to present plans the vessel is to be assigned to Geodetic survey work around the Aleutian Islands.

* * *

An illustration of the volume in trade with the East Coast is given in the movements of the **American-Hawaiian** fleet. August 1, the Georgian arrived at Seattle with what is believed to be the largest cargo of its kind ever booked by the line for this district. The 3200 weight tons of general merchandise is also believed to be a port record for non-bulk discharge. After discharge, the ship stowed 6000 measurement tons for return to the East Coast. Another ship, the Carolinian, arrived August 10 from South Atlantic ports with heavy cargo, and two other liners were due to arrive before the end of the month, fully laden when they leave the Atlantic and with lift capacity cargoes for the East Coast. These are the Nebraskan and Dakotan.

* * *

Bids for dredging and excavating the last section of the Vancouver-to-Bonneville ship channel were to have been called for on August 27. The project will cost between $300,000 and $400,000 and will provide a 27-foot channel 300 feet wide for the entire distance from Vancouver to the dam, thus making the Columbia River navi-



Contrapropeller-formed stern frame of Pathfinder, a survey ship to be launched from Lake Washington ways this month

gable for large vessels to The Dalles, Oregon.

The strange destruction of three cigar-shaped log-rafts, containing a potential 15,000,000 board feet of lumber for National Defense, has given rise to ominous suspicion in the little city of Cathlamet on the lower Columbia River. The rafts burned or disintegrated at sea in a way still unexplained.

* * *

The famous U. S. Geodetic Survey ship Surveyor, originally built in World War days to be a mine sweeper, and then afterwards turned over as a survey vessel, which long operated in Alaskan waters, has finally after all these years gone back to the Navy. The work of changing her to her original type as a mine sweeper will be done by the **Lake Union Drydock & Machine Works** at Seattle.

Short-Shorts

Western Gear Works of Seattle is announced as low bidder at $847,248 for a naval contract involving the furnishing of cranes and hoist machinery for six battleships under construction at the Brooklyn, Philadelphia and Norfolk Navy yards. The machinery will be similar to that built by this company for the Puget Sound and Boston Navy yards and for several shipbuilding companies.

* * *

The Danish motorship Nordvest, tied up in Aberdeen since Hitler invaded Denmark, sailed August 16 for Seattle under American flag where she will be drydocked and inspected, after which she will go to South America for nitrate cargo.

* * *

It is understood that the new Tacoma Narrows Bridge, replacing the one which collapsed, and upon which insurance claims have now been settled, will be a four- instead of a two-lane highway.

The U. S. S. Cinchona, third of four anti-submarine net tenders built by the **Commercial Iron Works** of Portland, was delivered to the Navy on August 7 and departed for an unannounced destination. The U. S. S. Buckeye, last of the quartette, was then due soon to be released for her official trials.

Bids for repairing and repainting the Government's seagoing dredge Col. P. S. Michie were due to be opened at Portland August 25.

Maritime Shipyards, Seattle, have launched the small motor survey ship Patton, built under contract by S. E. Sagstad from plans by H. C. Hanson. She is a twin-screw motor vessel with a cruising radius of 4500 miles and will be used in charting the waters of southwestward Alaska. She will be commanded by **Lieut. Casper M. Durgin** and was christened by **Miss Sobieralski,** daughter of **Commander A. M. Sobieralski** of the Coast and Geodetic Survey.

The **Puget Sound Tug & Barge Co.'s** tug Goliath, after recently towing the old Lake Washington ferry from Seattle to Terminal Island, California, on her return trip stopped at San Francisco and brought north with her the ferry San Mateo, purchased on the Bay by the Puget Sound Navigation Co. This brings this company's fleet to 21, twelve of which formerly operated on San Francisco Bay. Two more ferries of the Golden Gate fleet, City of Sacramento and Napa Valley, purchased by the Puget Sound concern, are still in Oakland.

Construction of a breakwater north of the entrance to Depoe Bay on the Oregon Coast at a cost of $214,000 was recommended to Congress by the Army engineers on August 6. The project would make an entrance channel 8 feet deep, 30 yards wide, and create an inside basin 350 by 750 feet with 8 feet of water.

Personal Gleanings

Chief Boatswain **H. O. Neilsen,** recruiting officer for the Coast Guard at Seattle, reports that he has had unusual success lately in enlisting young men in his branch of the service and that the Coast Guard seems to have a special appeal to those who wish to live really close to the sea in wartime or peace. . . . Major **Paul Berrigan,** engineering officer for the Portland district, U. S. Engineering Corps, has been transferred from there to Dallas, Texas, as assistant division engineer. . . . **Edwin H. Brown,** veteran Seattle transportation man, for a number of years passenger agent for the **N. Y. K.,** has been appointed manager of the Validating Bureau of the **Transcontinental Rail Lines.** He retired from the N. Y. K. in accordance with the age rules of the company. . . . At least one Seattle naval man was aboard the United States Gunboat Tutuila when she was bombed by Japanese planes far up the Yangtse River at Chunking. He was **Charles Rourk,** 29-year-old boatswain's mate, who enlisted in November, 1940. . . . Rear Admiral **Herbet Pott,** naval attache with the British embassy at Washington, made a tour of the Navy yard and defenses in the Thirteenth Naval District recently. The official's visits are for the purpose of making contacts and effecting cooperation between the British and American naval staffs. . . . **George A. McNicholl,** a dean of both steamship and railway passenger service on the Coast, has retired from the Canadian National Railways at Vancouver, after more than fifty years in the transportation service.

News FROM THE PACIFIC SOUTHWEST

by K. M. Walker

As of August 15th

Galapagos Islands Being Developed

Lying astride the equator some six hundred miles west of Panama, and under the flag of Ecuador, the Galapagos Islands have been the base for the tuna clippers operating out of Southern California ports but have seen little development of their mineral resources. The tropical somnolence hanging over these islands is being broken by the Pacific Development Company of New York which, with a grant of $500,000 from the Federal Loan Administration, has commenced operations on a broad scale.

With the approval of the Ecuadorian Government, they have set up a powerful radio station on Albemarle Island, the largest in the group, which has two excellent deep-water harbors. Their lease covers the exploitation of mining and cattle raising and runs for 30 years.

A large tannery is under construction and the company has shipped a quantity of mining machinery from the States and is proceeding with development. Apparently, the concession granted by Ecuador does not include the fisheries rights, a matter of primary concern to the tuna fleet.

A further development of these islands is seen in the report that the United States and Ecuador will collaborate in setting up defense depots, probably in connection with the coastal patrol, which will mean the establishing of naval bases and consequently the arrival of civilian and service personnel.

California Port Authorities Meet

The highlights of the meeting of the California Association of Port Authorities in the Grant Hotel in San Diego on Friday July 25 were a number of resolutions sent the U. S. Maritime Commission and the Bland Merchant Marine Committee of the House. These included:

Opposition to the proposed construction of 300,000 freight cars inasmuch as the steel required would be enough to build 6000 of the Maritime Commission C-2 type vessels. It was pointed out that ships are at a premium and the water-borne tonnage problem is becoming more acute daily; also that this condition will exist long after the war is ended, and, if we are to maintain our proper position as a leading maritime nation, we must devote our energies to ship construction.

A request for the allocation of more ships to the intercoastal trade. This has dwindled until now there are less than 250 sailings annually, whereas an absolute minimum of 500 sailings a year is required to handle the volume of cargo offerings.

Diversion of the entire Asiatic traffic to the Pacific Coast and shifting vessels engaged in this trade from the Atlantic to the Pacific. It was pointed out that this move would expedite cargoes, would save forty per cent in bunkering and would remove the ships from the menace of submarine attack. Further, such vessels could return with vitally necessary defense supplies such as tin and crude rubber and would handle more cargoes quicker, which is tantamount to adding more ships to the merchant marine.

In addition to the recommendations sent to Washington was the proposal to take steps to guard against sabotage and set up some means of watching terminal and waterfront properties. A special committee has been appointed to work out details of this protection.

Attending the Association meeting were:

San Francisco: H. C. Johnston, associate traffic manager, and J. F. Marias, president, State Board of Harbor Commissioners.

Los Angeles: Harbor Commissioners Burt A. Heinly, G. H. Moore and M. G. Rouse; and Assistant port manager R. H. Beaton.

Long Beach: W. R. Martin, Harbor Commission president; W. D. Lamport vice president; J. L. Kelly, secretary; and Charles A. Bland, traffic analyst.

Oakland: A. H. Abel, port manager; and M. D. McCarl, traffic manager.

Stockton: C. O. Burgin, port traffic manager.

San Diego: Joe Brennan, port director.

Disaster Overtakes Log Rafts

After operating the unique deepwater log rafts for many years without loss, the Benson Lumber Company has suffered heavy loss by fire and heavy weather in three log rafts in succession. These giant affairs approximate nine hundred feet in length and fifty feet in width and contain almost 5,000,000 board feet of lumber in the huge logs. The rafts are made up in immense cradles at Kathlamet, Washington, and are towed by a deep-sea tug to San Diego where they are sawn by the Benson Lumber Company in the only saw mill in that city. The two ends are pointed, like a double ended ship, and the center section is straight for a length of about 500 feet. Heavy steel stud link chains, spaced every twelve feet, bind the logs into a unit.

On September 18, 1940, the Log Raft Number 118 caught fire mysteriously at sea and a loss of about 2,000,-

000 feet of lumber was the result.

Log Raft Number 119 was caught in heavy weather when off San Francisco on July 7,1941 and broke in two pieces. The tug proceeded with the front section to San Diego and another tug was despatched from San Francisco and towed the after section to its destination.

On Tuesday August 5, disaster overtook Log Raft Number 120 fifty miles north of San Francisco when another mysterious fire raced through the length of the raft, reducing the above-water portions to ashes and causing the raft to break into three main sections and a mass of drifting logs, which became a serious menace to navigation.

The loss by heavy weather sustained by log raft 119 is understandable, but it is difficult to comprehend how an ordinary fire could burst out and in a few minutes envelope such a compact mass of logs as represented by these rafts. The Benson Lumber Company have another log raft under construction at Kathlamet, but, in view of these losses, they may not attempt the tow and may abandon the practice of supplying their mill in this manner.

Another Pier For San Diego

When the Government undertook construction of the new pier at the foot of E Street, it was necessary to demolish the small pier used by the commercial fish houses located across the Embarcadero and confronted the city with a problem in arranging for accommodation for the many small, fresh fish boats.

The city drew up plans for a new fish pier of the mole type to cost approximately $325,000. It will be 750 feet long and 266 feet wide and will house the nine commercial fish companies, forced out of their old quarters, in a new building on the pier, 405 feet long and 130 feet in width. The mole will be filled with about 160,000 cubic yards of material dredged from the bay bottom. Located at the foot of G street, it will be adjacent to the old pier, and the fish houses will be doing business in the same locality as before.

Backed by an appeal of Rear Admiral Charles A. Blakely, 11th Naval District Commandant, the Works Progress Administration in Washington rushed approval of the plans and allocated $200,000, the city to provide the balance.

U. S. Destroyers at sea in rough weather

Salvaging Axis Vessels

Salvage operations are under way at Puntarenas, Costa Rica, on the Italian Line motorship Fella and the North German Lloyd liner Eisenach. Both vessels were scuttled by their crews at the outbreak of the war and have lain partially submerged in the harbor and ravaged by the fires set by the crew.

The two vessels were purchased by the Siegfried Olson Line for the sum of $25,000 and Capt. Brown with the salvage tug Retriever, was called in to handle the refloating of the ships. After they have been floated and put in condition for towing, they will be taken to San Pedro, rebuilt and assigned to transpacific service.

Personalities

William E. Harper, appointed several months ago to fill a vacancy arising through the resignation of Rufus Choate, has been reappointed for a four-year term by Mayor Benbough as San Diego Harbor Commissioner. His appointment will expire April 30, 1945.

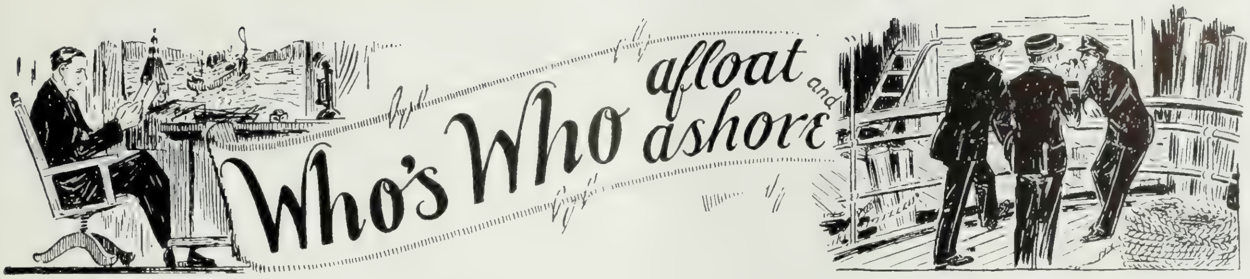
Fred J. Phelan, until recently in the quarantine office at San Francisco, has been transferred to San Diego, as Paul Howard, San Diego Supervising Quarantine Officer, considered an additional man was needed to handle the growing amount of plant inspection on naval and commercial vessels in the port.

Harbormaster Homer Guthrie returned recently to his B Street pier office from a month's vacation in the Northwest. He advised that saw mills are springing up in Oregon and Washington to care for the large increase in lumber demand, and that the shipyards on the Columbia River are all loaded with work. He took in the Bonneville Dam and reports the big aluminum plant approaching completion.

Capt. Max Frucht, recalled to active service following his retirement a year ago, now holds one of the most important posts with the Maritime Commission. His headquarters are in Honolulu and he has control over ships returning to the Pacific Coast from Southern Asiatic ports, India, Burma and Ceylon, with such cargoes as tungsten ore, manganese, mica, teakwood, burlap and shellac. He also has jurisdiction over vessels returning from the Philippines with copra, coconut oil, hemp and chrome ore.

A host of friends up and down the Coast mourned the passing of Capt. John O. Olsson, 61, veteran steam schooner master and for many years on the bridge of the Dorothy Phillips. Capt. Olsson passed away in Long Beach August 13.

(Page 75, please)



Who's Who afloat and ashore

Edited by Jerry E. Scanlon

GRACE ENGINEERS

George Curran, chief engineer on Grace Line's Santa Monica, has just returned from a month's vacation. He is "standing by" waiting assignment by Marine Superintendent Edward T. Senter.

During his vacation **First Assistant James E. Knox** went out on the Santa Monica as temporary chief. The first assistant's berth was filled by Andreas Schmidt who was transferred from the West Celeron. This is the Shipping Board vessel Grace Line was assigned by the Maritime Commission as temporary replacement tonnage.

* * *

SHIPS AND MEN

George A. Eubanks, formerly purser on the Cape San Martin, which was transferred from the North Pacific - California - South American service of Grace Line to the Atlantic Coast replaced George T. Doelker in this post on the Santa Monica.

* * *

Reynold Homme is now second engineer on the freighter West Celeron. He was shifted from the same post on the Cape San Martin.

* * *

The Standard Oil Company's 800-ton tanker **Standard Service** which has been doing duty in Alaskan waters has been ordered back to San Francisco to engage henceforth in the California coastwise and inland service.

* * *

NEW SHIP NAMES

Well-known vessels that operated in Pacific waters which have had their names changed include the Sage Brush to Keystone; Exporter to U. S. S. Hercules; Cape Douglas to Idaho; Danish motorship Gertrude Maersk to Cavalcade and to Panama registry; and the Hulda Maersk renamed the Chant and also having her flag changed to Panamanian.

APL EXECUTIVE

E. Russell Lutz, identified with San Francisco shipping and business activities since his arrival from Washington last March, in the space of six short months has won for himself an enviable place in the business, civic and social life of the Bay Area.

Coming here as assistant to the president, the position of Mr. Lutz in the American President Lines has now become doubly important while his chief, Dr. Henry F. Grady, is in the Philippines surveying the Far East economic situation at the bidding of President Roosevelt.

Despite the demand on his time to "get the swing" of his new and highly important post, Mr. Lutz is now prominently identified with many of the outstanding events having to do with the furtherance of the best interests of the West Coast maritime industry. His long and varied experience in Washington is proving invaluable to fellow associates.

During his eleven years with the State Department (1926-37), Mr. Lutz had considerable foreign service, being identified with the Mixed Claims Commission, U. S. and Germany, and the Tripartite Claims Commission, U. S., Austria and Hungary (1928-30), and U. S. and Mexico (1934-37).

Among his fraternal affiliations are the American Society of International Law, American Bar Association, and the Yale Club of Washington. Right at present Mr. Lutz is devoting a great deal of after-office hours to furthering the success of the fifteenth annual national convention of the Propeller Club of the United States and the American Merchant Marine Congress to be held October 21 to 24 in San Francisco.

E. Russell Lutz

Shipbuilding Heritag

There is little to fear with the coming years that San Francisco Bay shipyards will not be directed by capable executives.

Today, as they have been for the past several years and not just since the emergency, are sons of a number of the leaders of shipbuilding in this area, growing up in the industry.

Albert S. Gunn, Jr., son of the general manager of Bethlehem Shipbuilding Corporation, Ltd., Union Plant, is learning the business, not under his father, but at the Fore River Plant of Bethlehem.

●

Joseph A. Moore, Jr., who is carrying on the Moore traditions at world-famous Oakland yard as president

●

James R. Moore, coming up fast to accept responsibilities entrusted to his talents and zeal

These Sons will be ready!

Just as soon as the Junior Gunn finished school he entered the Fore River yards. Reports indicate he is advancing on merited recognition.

John T. Greany, Jr., whose father is one of the best known marine executives in his position as sales manager for Bethlehem in San Francisco, is learning the steel business at the local plant. He is also an aviation student and is taking lessons when off work to secure his pilot's license.

Across San Francisco Bay in the newly equipped and expanded plant of the General Engineering & Dry Dock

Alfred S. Gunn, Jr. . . . digging in at Bethlehem's Fore River yard for practical knowledge of his chosen career

Jack A. Armes of General Engineering & Dry Dock Company is a good right-hand bower of his illustrious father

John T. Greaney, Jr., who is already climbing the ladder of a shipbuilding career at Bethlehem's San Francisco plant

Company, President **George Armes' son Jack,** with increasingly important duties, has been playing an important role in the defense building his father's yard has been commissioned to carry out by the Government.

Joseph A. Moore, Jr., is the president of the Moore Dry Dock Company; his father chairman of the board. A long and varied career in the business is the record of Joseph, Jr., before he was named head of this large concern which now has contracts to build 12 vessels for the Maritime Commission in addition to a long list of vessels to be repaired.

During the many labor-employer controversies over wages and working agreements, the clear vision and level-headed ideas advanced by Joseph Moore, Jr., who represented and is acting as contact man in these matters, won for him the admiration of fellow associates as well as the union leaders.

His brother **James ("Jim")** is also actively identified with his father and brother in the spectacular activities of the yard, and, from sources close to the picture, we learn that he, too, is showing his mettle in his chosen endeavor.

SUB VICTIMS SAVED

Private advices have trickled through from East Coast sources that Captain Lester Hanson, master in the American-Hawaiian's service, had picked up 32 survivors of a torpedoed British freighter in the South Atlantic. The castaways were landed by Captain Hanson's vessel in Cape Town.

Prior to their rescue the victims had spent fourteen days in the boats. Many were near exhaustion when picked up, but were well on the way to recovery when they disembarked in the South African port.

Another A-H skipper who figured in a dramatic rescue dash was **Captain F. B. Roberts** of the Ohioan, who speeded his vessel to a spot in the same locality in response to an S. O. S. from another British sub victim.

* * *

GRACE AGENTS

The Lautaro Nitrate Company became agent for the Grace Line at the port of Taltal, Chile, recently, following the closing of the Grace Line's office there, according to the shipping company's announcement. The newly appointed agency has always handled the stevedoring and lighterage at that port for Grace.

YOUNG MEN WANTED

F. C. Farrar, enrollment officer for the Maritime Service in the United States Customs Building, San Francisco, announces young Americans in good physical condition and with a fair knowledge of the Morse code are wanted to attend the United States Maritime Service Radio School, Gallup's Island, Boston.

Applicants who are accepted undergo ten months' instruction, receive transportation both ways, pay of $36 monthly and a third class operator's license on completion of the course.

Farrar announces a few vacancies for training at Hueneme, California, and aboard the training ship American Sailor are open to youths between the ages of 18 and 23.

* * *

SAINT ANDREW

After many years of effort by men of the sea, a monument has been erected to the memory of **Andrew Furuseth,** founder of the Sailors Union of the Pacific.

The testimonial in stone is in the garden square in front of the Ferry Building, San Francisco. Selection of a proper site was the question at issue when the subject of a fitting tribute to the "Saint of Sailors" was decided.

* * *

WEST CELERON

Howard Halterman was succeeded as second officer on the steamer West Celeron by Clifford C. Weidemann, the latter formerly in the same berth on the Cape San Martin. Haltermann is remaining shoreside for a ship.

One of the best known of the McCormick Steamship Line intercoastal skippers is **Captain A. H. Westerberg.** He is in command of the S. S. West Ivis.

Before the present emergency Captain Westberg's ship was the locale for a number of scenes used in the movies and the valuable technical advices given by Captain Westerberg has won for him the gratitude and close friendship of some of cinemaland's best known directors.

CONCRETE BARGES

Reminiscent of the 1917-18 World War feverish shipbuilding days, discussions are now going on and have been for a month between about twenty concrete construction officials and shipping experts with the Maritime Commission heads to consider the feasibility of building reinforced concrete tow barges to haul oil, grain and other bulk commodities.

The Commission's spokesmen said that the meetings were exploratory for the time being and emphasized that for the present the conferences centered only around concrete barges. Dimensions under consideration are a length of about 330 feet on the waterline, a beam of 45 to 50 feet and a draft not in excess of 30 feet when loaded.

Under consideration are plans for barges to carry at least 6,000 deadweight tons per barge. In order to eliminate, as far as possible, expensive and complex equipment, these barges would be designed to operate without personnel.

The concrete steamer Faith, built and launched under leadership of W. Leslie Comyn at Redwood City, California, designed as a seagoing steamer is remembered as one of the emergency fleet construction efforts of the last World War.

San Francisco
Chamber of Commerce
333 Pine Street

August 15, 1941.

Mr. Jerry E. Scanlon
Editorial Department
The Pacific Marine Review
500 Sansome Street
San Francisco

Dear Jerry Scanlon:

Best wishes to you in your new spot. I was happy to read about it in the current issues of Pacific Marine Review. I am sure your department is going to prove of great interest to the shipping fraternity and of consequent value to the publication.

Sincerely,

Harold A. Burroughs
Publicity Department

* * *

INSTRUCTOR

Leo Sullivan, son of the late Michael Sullivan, veteran marine engineer, has passed his examination as instructor for the Maritime Commission's School, Alameda. He served as second assistant on the liner President Taft until he came ashore to take the examination, passing with high honor.

WALDO DRAKE

Hundreds of his friends and acquaintances in the marine world will be pleased to learn that Waldo F. Drake, dean of the waterfront editors at Los Angeles Harbor, is now Commander Drake, USN., in charge of all public relations for the 11th U. S. Naval District and spending a great deal of time afloat on the Flagship of the Pacific Fleet.

An ensign during World War I, Waldo Drake is perhaps one of the best informed men on the Pacific Coast as to naval affairs. After the last war he was called to Washington to aid in the preparation of the part played by the U. S. Navy.

Commander Drake is on leave from his post with the Los Angeles *Times* for the duration.

* * *

TRADE TOUR

A group of members of the Los Angeles Chamber of Commerce will embark upon their 17th trade tour of the Hawaiian Islands on September 10, the purpose of which is to secure a larger share of Hawaii's $400,000,000 annual business volume. Advance arrangements have been under the direction of Charles P. Bayer, Chamber secretary.

Steadily advancing to the front in the Pacific Coast shipping business is D. N. "Bob" Lillevand, operating manager for Grace Line. Quiet, unassuming and thoroughly grounded in all phases of steamship operation, "Bob" is well regarded by the officers and unlicensed men above and below deck of the Grace fleet. The same is true of shore-side associates and men of the marine world.

Years ago "Bob" as a youth entered the Seattle offices of W. R. Grace & Co. Then around 1936 he went to Los Angeles under Guy E. Buck. When Buck was transferred to San Francisco Bob was made manager, in Los Angeles. When another change was made and Buck again went to Los Angeles, Bob was brought to San Francisco by Vice President Fred L. Doelker and appointed to his present post. He is well acquainted in the local shipping fraternity and is regarded with the respected esteem which surrounded his career in the Northwest and in Southern California.

He is married and the father of two children. The family home is in Alameda.

PATRIOT STAFF

The Alcoa Patriot, C-1 new freighter built at Bethlehem and now en route to South America for a single trip for Grace Line, left here in command of **Captain P. H. Oiestad.** His chief officer was **E. K. Thorsen** and **Donald Johnson** was second officer.

Malcom Wright went out as chief engineer and Ray Hazelwood as first assistant engineer.

The vessel was only assigned Grace Line for the trip to the Spanish Americas. In Chile she will load a full ore cargo for the Atlantic and be turned over to her owners, the Alcoa Steamship Company.

* * *

GRACE

Captain Curt Zastrow, commodore of the Grace Line and master of the flagship Santa Rosa, on his three months' vacation spent his time at his home at Chicken Point, San Rafael. A resident of Marin County since his quartermaster days with the old Pacific Mail Steamship Company, Captain Zastrow continues to maintain his home there despite the fact that he has been sailing out of New York to South America for the last three and one-half years.

* * *

CHRIS BLAKE

Chris Blake, who is well known as former chief engineer on vessels of the Shepard Line, and Dave Ellis, formerly head of the engineering department on McCormick Line vessels, are both now shore side and engaged at the Union Plant of the Bethlehem Shipbuilding Corporation, Ltd.

aptain John Strom *Chief Engineer Otto Ehlers*

Two veteran shipmates long time in the employ of the McCormick Steamship Company are Captain John Strom and Chief Engineer Otto Ehlers. However, the transfer of so many of the company's vessels to other trades due to the war demanded that Chief Engineer Ehlers shift to the S. S. Charles R. McCormick. Before he packed his bag he and Captain Strom were photographed on the bridge of the latter's command, the S. S. West Nilus, and are shown in the only manner they ever consent to pose which is . . . minus their caps

BUREAU

The American Bureau of Shipping has recently appointed Benjamin S. Free to the San Francisco office and has transferred Charles J. L. Schoefer from San Francisco to San Pedro.

* * *

LLOYDS

Word was received from London that Lloyds Register of Shipping, authoritative manual of merchant ships and other factual data, will be delayed three months in publication. War losses and inability of securing authentic information, was ascribed in marine circles as the reason for the delay.

* * *

ENGINEERS

The ranks of the seagoing officers above and below deck out of Pacific Coast ports are being depleted due to the demand for experienced and capable executives for shore-side berths.

Lloyd Dietdrich, formerly chief engineer on McCormick Steamship Company vessels, is now in San Francisco headquarters of the Maritime Commission.

"Judy" McMann, known to thousands of bay commuters as chief engineer on Golden Gate ferries, is now with the Maritime Commission headquarters as inspector in Norfolk, Va., but hankers to return to the Pacific Coast.

* * *

CAPT. SEARS

Early in July, Captain Arthur H. Sears, coast pilot for the Weyerhaeuser Line (Pacific Coast Direct Line, Inc.), left for the East for a six-weeks' vacation and a reunion

with former shipmate Captain P. B. Blanchard, chairman of the board of the Pacific Coast Direct Line.

* * *

CHIEF LARRY COOK

Chief Engineer Larry Cook, formerly on ferries of the Golden Gate-Southern Pacific, is now head of the engine room of Matson's freighter Permanente.

* * *

Salute to Eddie!

W. Edgar "Eddie" Martin has been a marine representative for the Westinghouse Electric & Manufacturing Co. on the Pacific Coast for the past 19 years. He is a familiar figure from Seattle, Washington, to San Diego, California, wherever men plan, build and run ships.

A youngish appearing veteran of a quarter of a century's service with Westinghouse, Mr. Martin knows ships from keel to bridge—and knows what makes them go. A native of Brooklyn, New York, he followed Horace Greeley's advice early in life, moving with his parents to Denver, Colorado. He attended North Denver High School, then graduated from the University of Colorado in 1915 as a Bachelor of Science in Electrical Engineering.

In the fall of 1915, Mr. Martin entered the employ of the Westinghouse Company at East Pittsburgh, Pennsylvania, as a graduate student. His preference for marine engineering became apparent soon after, and he decided to specialize in ship propulsion apparatus and auxiliary equipment. In 1916 he became a full fledged member of the marine department. During much of this period, his evenings were spent as a teacher in the Westinghouse Technical Night School.

In 1920, Mr. Martin took a postgraduate course in Carnegie Institute of Technology at Pittsburgh. In 1922 he was transferred to the West Coast as a marine representative, with headquarters in San Francisco.

Hustle and bustle in the shipyards today, occasioned by the National Defense Program, is a familiar story to Mr. Martin. He recalls another day when the Government was seeking—and getting—wartime fighting ships, cargo carriers and transports. When the United States entered the World War in 1917, he was assigned to the Government section of the Westinghouse marine department, which played an important part in helping to power and equip ships that made America strong on the world's oceans.

W. Edgar Martin

Since his transfer to the West Coast, Mr. Martin has been active not only in the company's marine affairs but also in numerous other activities of the marine industry. For three years he served as a member of the Board of Governors of the Propeller Club of California—now the Mariners' Club of California. He also holds membership in the Propeller Club of the United States, the San Francisco Commercial Club and the Marine Committee of the San Francisco Chamber of Commerce.

Ships even carry over into "Eddie" Martin's after-office-hours' activities, for he counts them among his hobbies. Like the postman who takes a hike after completing the day's mail deliveries, Mr. Martin may be found on numerous week-ends and holidays—somewhere in a shipyard or elsewhere along the waterfront. Adept at table tennis, he also occasionally breaks a 90 at golf.

Married since early June, 1917, Mr. and Mrs. Martin reside in San Mateo, California. They have one daughter, Miss Phyllis Jean Martin.

* * *

USMC ASSIGNMENTS

In recognition of his splendid service in his San Francisco post of United States Maritime Commission cadet training instructor, Harold V. Nerney was advanced to the same position with headquarters in New York.

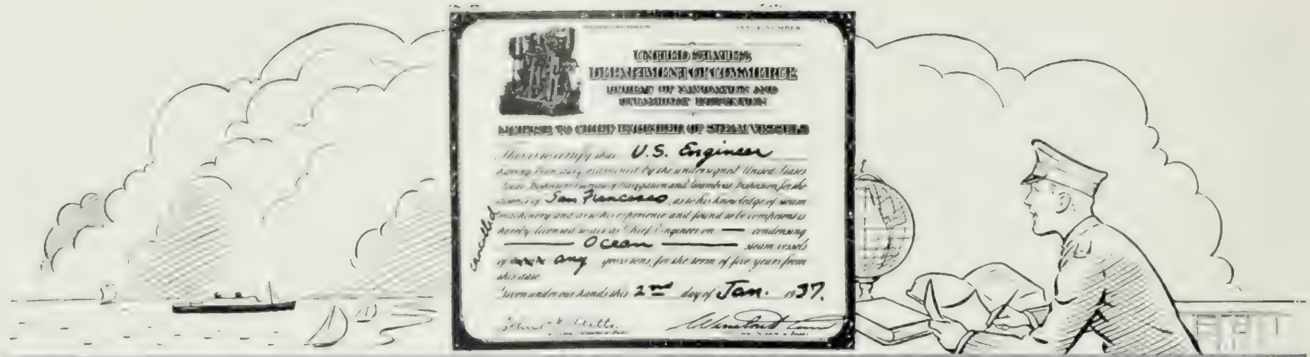
Resignation of Captain P. C. Mahady from the New York berth resulted in the decision of Admiral E. S. Land to assign the vacancy to Nerney upon his record of accomplishments in the West Coast office.

Nerney is a graduate of the Massachusetts Schoolship and previous to joining the Maritime Commission was connected for ten years with the Hydrographic Office, United States Navy.

* * *

COORDINATOR

R. G. Banks, who was drafted from his post with the Intercoastal Steamship Freight Association by the Maritime Commission to coordinate Government requirements for ship space on canal route and coastwise ships, is located in the Commission's New York office, 45 Broadway.



UNITED STATES
DEPARTMENT OF COMMERCE
BUREAU OF NAVIGATION AND
STEAMBOAT INSPECTION

LICENSE TO CHIEF ENGINEER OF STEAM VESSELS

U.S. Engineer

San Francisco

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Ocean

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2nd day of Jan. 1937.

Your Problems Answered

by "The Chief"

"The Chief's" department welcomes questions—Just write "The Chief," Pacific Marine Review, 500 Sansome Street, San Francisco, California

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ENGINEERING THERMODYNAMICS

QUESTIONS FROM THE SHIPS

QUESTION

We send samples of our turbine main engine lubricating oil to the laboratory for testing at frequent intervals, and on the report we receive from them, I note that the KOH absorption figure is slowly going up.

Can you tell me: (1) how far this figure should be allowed to go before changing the oil in the system; (2) also will it be necessary to change all the oil in the system to bring this figure into safe limits; (3) will this figure be lowered by centrifuging the oil?

I have gotten a lot of good dope from your articles in the PMR in the past; in fact, it is one of the main reasons I continue the magazine.

Thanking you, I remain,
Sincerely,
W. E. H.
Richmond, California.

ANSWER

This is an exceedingly well-worded, practical and useful question.

KOH, or potassium hydroxide, is a strong alkali, the opposite from an acid. Acids and alkalis mixed together in the correct proportions neutralize each other to form neutral salts or substances.

In fact, the best, if not only, way to determine quantitatively the amount or proportion of an acid in a solution or mixture is to add an alkali slowly until there no longer is an acid reaction, as indicated by any one of the many tests for an acid or alkali. Then the amount of alkali added per unit of original mixture is a measure of the original acidity of that mixture.

For lubrication oils, a standard test for organic acidity is to add a standard solution of potassium hydroxide to the oil until there is no longer an acid reaction, of course not so much as to give an alkaline reaction. The acidity of the oil is then expressed as so many milligrams of KOH per gram of oil. A milligram, mg., is one thousandth of a gram, a unit of weight.

Organic acidity should not be allowed to exceed about .07 mg. of KOH per gram of oil. Note that 1 mg. per g. is .1 of 1%.

This acidity forms from oxidation of organic compounds of all kinds and of compounds containing sulphur, oxygen or nitrogen in the presence of moisture. It is just ordinary rot or putrification of organic materials. The oil itself does not do this, but impurities picked up by the oil will.

The entire oil system should be washed out and sweetened by ventilation. You will probably find scum and dirt of all kinds in the bottom of settling tanks or other places.

Centrifuging will help, but it is not a cure nor will it remove organic acidity. The manufacturer of the oil should be consulted about it. It is possible to put the oil through a process which will remove acidity, but this cannot be done aboard ship.

If you change oil, you should wash and purify the tanks and piping also. The smallest amount of fruit, foodstuffs or animal matter in the tanks, perhaps for years, will cause this condition.

The acidity, of course, acts like an acid and causes corrosion of the polished metalic parts.

QUESTION

Does not the following comment throw light on the problem posed by H. H. G. in the July issue?

There is no doubt about discharging directly into the main condenser and increasing the quantity of water. In my day we resorted to this practice when we did not want to sheet down the evaporate for scaling. The change over supplied sufficient "make up" water, but the "stalactites" on the lower boiler-shell-seam increased in girth and length.

Another factor is the relative values of the specific volume at 10

pounds gage and 1.5 pounds absolute—16.3 and approximately 231 cubic feet—a ratio of almost 15. With the present system of pipes, doubling the output would increase the velocity 30 times.

Even if the 30-foot-high loop was added to the system, it would be necessary to operate the evaporator with a shell pressure greater than the atmospheric pressure. I have used these 30-foot-high loops on industrial evaporators and under propitious conditions the loop did not prevent carry over of the liquid from the evaporator to the condenser.

"The Chief's" point about the conservation of heat is well taken. The effect of discharging into the condenser is twofold — heat sent overboard with the circulating water and added mechanical load to the condenser.

With 65-pound coil pressure and shell pressure of 10 pound gage, the temperature head = 312 — 240 = 72°. Assume 2 pounds shell pressure, then the temperature head equals 312 — 216 = 96° F. or an increase of only 30 per cent and not sufficient to double the output.

Equation of Heat Exchange:

Weight of water evaporated × Heat difference = Coil surface × Conductivity × Tempt. Head.

C. H.
San Francisco

"The Chief" welcomes constructive comments on all subjects. Thanks to reader C. H.

THERMODYNAMICS III

NOTE: The editor of PACIFIC MARINE REVIEW takes "The Chief" to task for stating in the August issue that "Heat is a substantial material like all other substances perceptible to one or more of the five human senses." He is an engineer of broad and extensive experience. Comment from other engineers is invited. What is heat?

Temperature of a Heat Mix

There are many problems in engineering involving the transfer of heat from one gas or liquid to another, and the necessity to calculate the amount of change in temperature.

For instance, when two or more substances at different temperatures are mixed, what is the resulting temperature?

In the theory of mixture, two basic rules are used.

(1) The weight of the mixture is equal to the weight of the several parts put into it.

(2) The total heat content of the mixture is equal to the heat content of the original parts before mixture.

QUESTION

If 10 pounds of water at 200° F. are mixed with 50 pounds of water at 100° F., what is the temperature of the mixture?

ANSWER

The mixture will be 60 pounds of water. Its temperature will be somewhere between 100° and 200° F.

The Btu content of the 200° water will be 200 — 32 = 168. 168 × 10 = 1680 Btu.

And of the 100° water, 100 — 32 = 68. 68 × 50 = 3400 Btu.

Total Btu = 3400 + 1680 = 5080. This is the heat content of 60 pounds of water. That of one pound would be 5080 divided by 60 = 84.66 Btu. Each Btu means 1° F. above 32 in temperature. Thus, the temperature of the mixture is 84.66 + 32 = 116.66° F. or about 17° F. warmer than 100° water.

NOTE: The constant 32 was deducted, then added again. This is unnecessary, as is shown in the following.

QUESTION

What is the formula for mixture temperatures?

ANSWER

From previous articles, we learned that the specific heat of a substance was the number of Btu required to raise one pound of it one degree F. or Btu per degree F. per pound. By definition of the Btu, the specific heat of water is 1 and all other substances except hydrogen are, strangely enough, less than 1.

If C = specific heat
W = weight in pounds
T = temperature in degrees F.

and subscript numerals indicate that these symbols apply to one of the several substances going into the mixture, then:*

$WCT = W_1 C_1 T_1 + W_2 C_2 T_2$

$WC = W_1 C_1 + W_2 C_2$

$$\text{Thus } T = \frac{W_1 C_1 T_1 + W_2 C_2 T_2}{W_1 C_1 + W_2 C_2}$$

Note that this formula was used in the foregoing water mixture problem, taking C_1 and C_2 as equal to 1. This formula is good for as many elements in the mixture as may be necessary by simply extending it.

QUESTION

If 10 pounds of 200° F. water are poured into a copper vessel weighing 5 pounds, what will be the temperature of the water after heating up the vessel from 70° F.? Specific heat of copper is .093.

ANSWER

$$T = \frac{10 \times 1 \times 200 + 5 \times .093 \times 70}{10 \times 1 + 5 \times .093} = 194.4^\circ \text{ F.}$$

QUESTION

One-half pound of hot coffee (specific heat 1 and temperature 210° F.) is poured into a porcelain cup (weight 2 pounds, temperature 60° F. and specific heat .255). Also added is .05 pound cream (specific heat 1 and temperature 50° F.). What is the temperature of the cup of coffee, ready to drink?

ANSWER

$$T = \frac{.5 \times 1 \times 210 + 2 \times .255 \times 60 + .05 \times 1 \times 50}{.5 \times 1 + 2 \times .255 + .05 \times 1} = 130.3^\circ \text{ F.}$$

This explains why the coffee in the pot must be hot.

An interesting application of this theory of mixtures is determining the temperature of some substance too hot to measure by thermometer.

QUESTION

How can the temperature of a furnace be obtained when the only temperature meter available is the ordinary glass thermometer?

ANSWER

Find a piece of steel such as a large nut weighing 2 or 3 pounds and place it in the flame or in whatever part of the furnace it is desired to measure. This can be done with a long bar of iron or whatever means is available.

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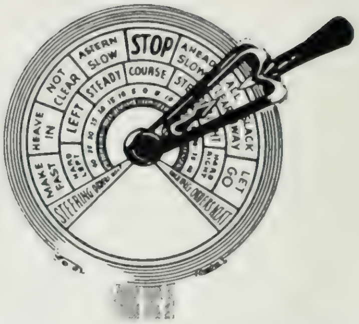
*In these equations, placing letters together horizontally indicates multiplication, thus WCT means W × C × T.

(Page 74, please)

Steady as you go!

KNOWLEDGE IS THE STRAIGHT COURSE TO ADVANCEMENT



A Department for Deck Officers

by "The Skipper"

Questions Welcomed. Just Address "The Skipper," Pacific Marine Review, 500 Sansome Street, San Francisco, California

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CARGO HANDLING

II—DUNNAGE AND DANGEROUS

GENERAL COMMENT

In the last month's installment of this section, we reviewed the inspection of cargo spaces, which should be the routine activity of deck officers on every vessel carrying cargo. After making and reporting on such inspections, the deck officers must remember always that if anything goes wrong with the cargo on its long voyage to destination it is they themselves who will have to do the explaining.

When cargo damage claims are formulated, perhaps at a port of discharge halfway round the world from the port of loading, a surveyor or an inspector comes aboard to investigate. The stevedore involved is 1000 miles away. The master and the first mate of the ship have to do all the explaining. It is up to them to know all the facts.

Or, on some wild night at sea, when every rivet in the old hooker is strained by the working of her hull and some heavy cargo breaks loose, it is poor comfort to remember that you were suspicious of that shoring and to wish you had insisted on having it done properly.

Improper preparation of cargo spaces and/or faulty stowage may be the cause, not only of heavy claims for damaged cargo, but also may cause heavy damage to the ship's hull or even cause the complete loss of both hull and cargo.

The deck officer should study intelligently the matter of operating costs. If the operation of your ship does not produce a profit, the owner cannot continue to use your services. Your salary depends on profitable operation, and profitable operation very largely depends on your intelligence and application in the management of the ship, the crew and the cargo.

This month we are devoting the space to rather full explanation of two problems put up to us by ships' officers, problems that we thought we had already covered.

"THE SKIPPER."

Questions From the Ships

Dear Skipper:

I am a cadet (deck) on a transpacific liner and am interested in what you wrote last month about dunnage. Is the danger of cargo damage from dirty dunnage as serious as you make out? No case has come under my experience and several deck officers whom I asked about it seemed to think it was not worth considering.

Yours truly,

J. G. S.

ANSWER

This letter brings up two very interesting and important problems: First, the question asked. Second, the attitude of deck officers to that question.

The question of clean dunnage is very important as the following well-known example will show:

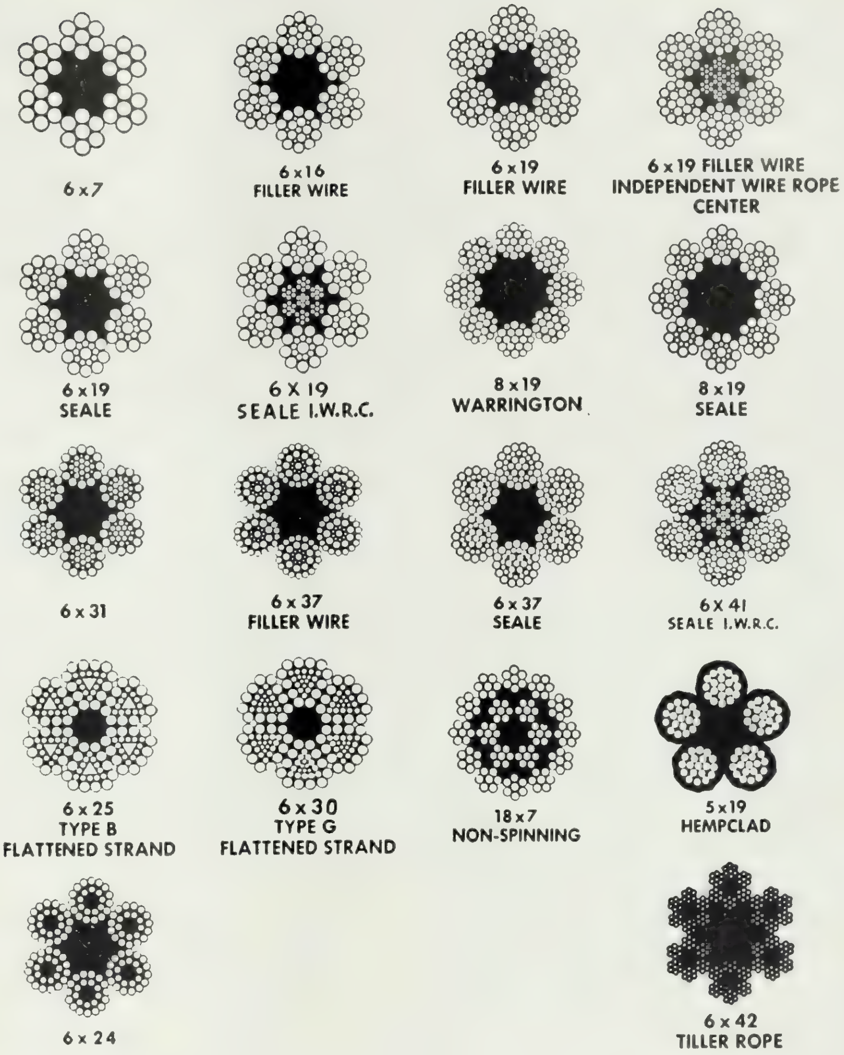
An intercoastal cargo carrier loaded at Los Angeles a part cargo of bulk potash, which was discharged at an Atlantic port. The dunnage used was landed on the ship's deck. On her westward run, she was to carry a large consignment of wire on reels for one of the San Francisco Bay bridges. The holds were thoroughly cleaned and inspected and the dunnage was inspected and everything declared satisfactory. Clean dry dunnage was specified and the ship's officers thought they were carrying out instructions to the letter.

On discharge at San Francisco, a considerable amount of the wire was found to be badly pitted and corroded. Much of the pitting was invisible to the eye but detected by the delicate testing apparatus used by the bridge inspectors. Chemical tests showed potash responsible for the damage, and further investigation proved that much of the dunnage used had been in contact with the potash cargo on the eastward voyage. Careful tests on this dunnage showed potash dust in many of the rough indentations of the boards. The wire was rejected and heavy damage claims had to be paid.

You might say that this is an extreme example, but you must agree that it shows very plainly the necessity for extreme care in the inspection of dunnage. The more common examples of damage through faulty dunnage are due to salt or to moisture or both. Many cargoes are hygroscopic (that is, they absorb moisture), and, if green or wet dunnage comes in contact with such cargoes, heavy damage is almost sure to result. Flour or other milled grain in sacks, dried fruit in sacks or cartons, nitrates, sugar, dry hides, grain in bulk or sacks, coffee, cigars, cigarettes, and various vegetable products, as cacao beans, are examples of cargo to which moisture is a deadly enemy.

You will often have dunnage lumber to transport from one port to another "dead head." Study this dunnage a little and see if you can find defects as green lumber, or salt encrustation, or contamination by some chemical. Dunnage so carried should be given, if possible, preferred dry storage tween decks, or, if carried on deck, should be protected from the weather and the sea.

The second point raised by your letter is the carelessness or ignorance of many officers on shipboard when confronted by problems that worry their subordinates. Every officer in the American Merchant Marine should feel his responsibility for the efficiency and morale of the crew. This feeling should prevail in normal times and should be acute under present conditions. The traditions of the merchant marine represent a calling of high honor and effective service to the profession and to the nation. These traditions and ideals should be passed on proudly from the older to the younger officers.



An interesting chart showing cross sections of some of the types of wire rope used in industry ashore and for various uses afloat. The 6 x 19 filler-wire type is the one most frequently used for cargo work aboard ship

QUESTION

What should be done to prepare holds or tween deck spaces for highly inflammable dangerous cargo?

ANSWER

As a rule, highly dangerous inflammable cargo is not shipped on general cargo carriers except in small special lots. It should not be carried in tween decks or hold, but should be on deck, properly lashed down and adequately protected from the weather. Such cargo should, if possible, be located forward of and under direct observation from the bridge. If anything happens that suggests fire, such cargo should immediately be hosed down or jettisoned, as circumstances indicate. Regulations for the carriage of dangerous articles are issued by the Department of Commerce at Washington, D. C. These regulations have the force of law and heavy penalties are attached. Every ship's officer should procure a copy and become familiar with its contents. The regulations classify dangerous cargoes as follows:

- Explosives:
  - Class A—Dangerous
  - Class B—Less dangerous
  - Class C—Relatively safe
- Inflammable liquids
- Inflammable solids and oxidizing materials
- Corrosive liquids
- Compressed gases
- Poisons:
  - Class A—Extremely dangerous
  - Class B—Less dangerous
  - Class C—Tear gases or irritating substances
- Combustible liquids
- Hazardous articles

This classification covers a wide variety and a great number of materials that are in common commercial transit. Many of these are comparatively harmless in themselves, but become highly dangerous when in risk of contamination by or mixing with certain other substances. Get the regulations and study these problems first hand.

Problems Answered

(Continued from page 71)

While the nut is heating up to the temperature of its surroundings, prepare a bucket of water, cold or cool. Set it on a board so as not to lose heat to the floor plates. Wrap a rag around its sides and use a board or rag cover to conserve heat.

Weigh the bucket alone and then the bucket plus the water, subtracting to get weight of water alone. Take temperature of water with a thermometer. Then when ready, withdraw the hot nut and drop it quickly into the water. Steam formed will be condensed in the cool water. Stir with a small wooden stick. Read temperature every 30 seconds while it is rising, and record the highest temperature reached. This will be T, the temperature of the mixture.

Then W_1 is weight of bucket

C_1 is specific heat of steel of bucket equals .11

$T_1 = T_2 =$ temperature of water and bucket at start

W_2 is weight of water

C_2 is specific heat of water$=1$

W_3 is weight of steel nut

C_3 is specific heat of steel$=.11$

$T_3 =$ temperature of nut and temperature of furnace

T is temperature of the mixture

From the foregoing formula and the assumption that total heat is the sum of the heats of the several elements, we have:

$$W_1C_1T + W_2C_2T + W_3C_3T = W_1C_1T_1 + W_2C_2T_2 + W_3C_3T_3$$

transposing by rules of algebra;

$$\frac{W_1C_1T + W_2C_2T + W_3C_3T - W_1C_1T_1 - W_2C_2T_2}{W_3C_3} = T_3$$

NOTE: If any of our readers try this, a report of success and findings will be appreciated. The accuracy depends largely on preventing loss of heat at the time of mixing. The larger the nut and the more water used the better. Enough water must be used so that no steam is allowed to escape. A flash of steam loss is unavoidable at the moment of dropping it into the water, hence the resulting temperature as calculated will be a few degrees less than actual values. Also some cooling of the nut occurs while transferring it from the furnace to water.

QUESTION

Can water steam mixtures be calculated also?

ANSWER

Yes. Knowing pressure, its heat content per pound is found in the steam tables. The Btu of the mixture is the sum of heat content of the original water and steam. The amount of steam to heat a quantity of water to a specified temperature is also calculated by this method.

QUESTION

What is the amount of steam used in heating feed water from 80° F. to 210° F. in an open heater (steam and water mix) using 10 pound gage steam? Water used is 10,000 pounds per hour.

ANSWER

Theory is, heat picked up by water equals heat dropped by steam.

Heat picked up is $10{,}000 \times 1 \times 130 = 1{,}300{,}000$ Btu.

Heat dropped per pound by steam is found as follows:

Ten pound gage total heat from tables = 1160 Btu.

Condensed and cooled, it has heat of liquid only at 210° F. = 178 Btu. $1160 - 178 = 982$ Btu dropped per pound. 1,300,000 divided by 982 = 1324 pounds of steam per hour used.

This adds to the water making 11,324 pounds of water per hour to boilers.

NOTE: Problems on mixture temperature have been reported in the examinations for chief engineer.

The American Merchant Marine

(Continued from page 53)

tated the building of Scotch boilers. Together with the expansion of our merchant marine must go the increase in operating personnel, and we are indeed fortunate that through the establishment of the Maritime Commission some five years ago, which started the ball rolling with a well-defined program for the building up of an American merchant marine, we find ourselves in this particular emergency about two years further advanced towards our desired goal than we were in the last crisis of the World War.

I personally do not feel that the types being built during this emergency are the most suitable for emergency conditions, and in this connection I quote from *British Motorship*, April 1941, as follows:

"But however dire the urgency of the matter may be, we must still not forget that there is a peace to be won as well as a war. . . If, at the end of the war, most of our cargo tonnage is of the slow-speed, uneconomical type, which will not meet the needs of the situation then existing, nor the competition of other countries, we may not win the peace, whatever be the result from the military standpoint."

In the editorial pages of *The Marine Engineer*, April 1941, the following is found:

"There is undoubtedly much to be said for Lord Rotherwick's view that one 16-17 knot ship is equal to two of the Government 'box' type, which cannot be depended upon to keep up more than 7-8 knots. While the fast ship can do two voyages for one performed by the slow ship, the call on destroyers is also reduced where fast ships are concerned. Lord Rotherwick thought it would have been a wise policy if a larger proportion of our yards had been reserved, provided fast ships were built, as a free ground for private enterprise, which would by now have resulted in a considerable volume of fast tonnage being at our disposal. Once the Government had decided, however, to take over shipbuilding into their own hands, no doubt their initial policy of building slow vessels was partly governed by the necessity of rapid shipbuilding expansion, difficulties in connection with material and shortage of skilled personnel. Now that we have got into our war stride the advantage of the fast cargo ship as against one of the 'box' type cannot be gainsaid."

I have quoted from the press of a country more involved in this war than we are, where it is agitated that ships of a faster type be constructed. Apparently others are thinking ahead and I strongly recommend that we do the same, as soon as facilities now under construction for the production of turbine machinery will permit.

NEWS

From Pacific Southwest

(*Continued from page 62*)

Yard Notes

The San Diego Marine Construction Company have laid the keel for the new Star and Crescent tug San Miguel. This vessel will cost around $75,000 and will have a Washington diesel, 460-horsepower main engine, and a 45-horsepower auxiliary. Delivery is scheduled for early December.

They have installed a new keel in the clipper Vantuna following an accident at Magdalena Bay and put in a full-length, one-piece stick in quick time to permit the vessel to get back into service for the high prices now prevailing for tuna.

The tuna clipper Santa Ines was docked at the San Diego Marine for examination for a prospective purchaser. Found to be in good shape, she was transferred to the ownership of the Hawaiian Tuna Packers, Ltd., of Honolulu, and will sail for the islands in the near future. This is the first of the refrigerated, California type clippers to go to the islands to fish for tuna where a uniformly smaller fish is obtained.

The Harbor Boat Works launched the new Mexican patrol boat Wednesday evening, August 20, and a delegation of Mexican naval officials were on hand for the ceremony. This is an 80-foot vessel and has aroused considerable interest as she is expected to make twenty knots with her two 450-horsepower diesel engines.

The Frank Hodgson Boat Company has completed the tuna clipper Monarch and delivered the $90,000 craft to the owners, Richard Oliver, Frank Brun, Anthony Rodrigues and Frank Hodgson. She will have a capacity for 200 tons of fish and a cruising range of 3000 miles and will fish for the Southern California Fish Company of San Pedro.

Pacific Coast Licenses Granted

Deck Officers' Licenses for July

Name and Grade	Class	Condition
SEATTLE		
L. B. Vincolione, 2nd Mate	SS, any GT	O
H. L. Grader, 3d Mate	SS, any GT	O
HONOLULU, T. H.		
W. Lewis, Chief	SS & MS, any GT	RG
K. S. Castle, Jr., 2nd Mate	SS & MS, any GT	RG
M. J. Uhl, 2nd Mate	SS & MS, any GT	RG
SAN PEDRO		
R. B. Cameron, Chief	SS, any GT	RG
J. A. Stepkins, Chief & Pilot	SS, any GT	RG
P. W. Shinn, 2nd Mate	SS, any GT	O
J. W. McCulley, 3d Mate	SS, any GT	O
JUNEAU, ALASKA		
F. I. Huxtable, Chief	SS & MS, any GT	RG
SAN FRANCISCO		
P. F. Butler, Master	SS, any GT	RG
C. R. Clark, Master	SS, any GT	RG
H. H. Cleaves, Master	SS, any GT	RG
H. C. Fridley, Master	SS, any GT	RG
R. C. Willson, Master	SS, any GT	RG
W. S. Dodge, Chief	SS, any GT	RG
B. V. Parker, Chief	SS, any GT	RG
R. A. Grimes, 2nd Mate	SS, any GT	RG
J. R. Howard, 2nd Mate	SS, any GT	RG
Louis Rossi, 2nd Mate	SS, any GT	RG
M. V. Tunstall, 2nd Mate	SS, any GT	RG
E. Brown, 3d Mate	SS, any GT	O
V. R. Kent, 3d Mate	SS, any GT	O
G. D. Shurtz, 3d Mate	SS, any GT	O

Abbreviations: SS is steamship; MS is motorship; GT is gross tonnage; O is original license; RG is raise of grade. All of these licenses are for ocean service.

Engineers' Licenses for July

Name and Grade	Class	Condition
SEATTLE		
D. H. Liliequist, Chief	MS, any GT	O
HONOLULU, T. H.		
G. W. Chipley, Chief	SS, any GT	O
H. H. Hill, 1st Asst.	SS, any GT	O
SAN PEDRO		
J. T. Glasscock, Chief	SS, any GT	RG
W. D. DeMunbrun, 2nd Asst.	SS, any GT	RG
V. B. Wampler, 2nd Asst.	SS, any GT	RG
J. L. Sullivan, 3d Asst.	SS, any GT	O
G. C. Bohlander, Chief	MS, any GT	O
C. Corum, Chief	MS, any GT	O
H. Pedersen, Chief	MS, any GT	O
JUNEAU, ALASKA		
R. W. Hinkley, 3d Asst.	SS, any GT	O
PORTLAND		
J. L. Wells, 2nd Asst.	SS, any GT	RG
D. E. Ellington, Chief	MS, any GT	O
SAN FRANCISCO		
D. L. Crawford, Chief	SS, any GT	RG
J. G. Grow, Chief	SS, any GT	RG
W. E. Hinshaw, Chief	SS, any GT	RG
O. G. Parker, Chief	SS, any GT	RG
J. A. Richlin, Chief	SS, any GT	RG
K. G. S. Robertson, Chief	SS, any GT	RG
R. C. Winston, Chief	SS, any GT	RG
R. L. Brooks, 1st Asst.	SS, any GT	O
J. R. Kay, 1st Asst.	SS, any GT	RG
M. W. Nichols, 1st Asst.	SS, any GT	RG
A. C. Clark, 2nd Asst.	SS, any GT	O
A. W. Crawford, 2nd Asst.	SS, any GT	O
A. D. Jamison, 2nd Asst.	SS, any GT	O
S. Kaiawe, 2nd Asst.	SS, any GT	O
J. D. Lambert, 2nd Asst.	SS, any GT	O
G. Mitchell, 2nd Asst.	SS, any GT	O
M. Soto, 2nd Asst.	SS, any GT	O
Sideny Stern, 2nd Asst.	SS, any GT	O
E. D. Albertson, 2nd Asst.	SS, any GT	RG
W. MacPherson, 2nd Asst.	SS, any GT	RG
E. J. Reeb, 2nd Asst.	SS, any GT	RG
G. S. Twitchell, 2nd Asst.	SS, any GT	RG
P. J. Cadigan, Jr., 3d Asst.	SS, any GT	O
L. R. Chandler, 3d Asst.	SS, any GT	O
E. J. Deschane, 3d Asst.	SS, any GT	O
W. E. Gill, 3d Asst.	SS, any GT	O
F. L. Knowles, 3d Asst.	SS, any GT	O
D. S. McLean, 3d Asst.	SS, any GT	O
Luis F. Rodriguez, 3d Asst.	SS, any GT	O
W. F. Erskine, Chief	MS, any GT	O
E. R. Reeves, Chief	MS, any GT	O
E. C. Berlin, Chief	MS, any GT	RG
R. C. Warner, Chief	MS, any GT	RG
L. A. Mize, 3d Asst.	MS, any GT	O

Abbreviations: SS is steamship; MS is motorship; GT is gross tonnage; O is original license; RG is raise of grade. All of these licenses are for ocean service.

New Shop and Storage Building For Robins

A contract for $1,000,000 for the erection of a new manufacturing and storage building at the Erie Basin yard of Robins Dry Dock & Repair Co., Brooklyn subsidiary of Todd Shipyards Corporation, One Broadway, New York City, has been awarded to the C. J. Moore, Inc., building and contracting organization. The new building will be 502 feet long and 152 feet wide, with an approximate ground area of 76,000 square feet.

One half of the building, lengthwise, is of reenforced concrete, completely faced with smooth buff brick, which has been adapted as the standard for all buildings in the yard. This portion of the building will be three stories high and will be devoted to various specialty departments such as sawmill, pipe-fitting, pattern shop, joiners shop, electric shop etc.

The other half of the building is of structural steel skeleton enclosed with masonry wall, faced with similar buff brick. This portion has an unbroken interior height approximately equivalent to the adjoining section and will be equipped with an overhead traveling crane, serving the greater portion of the length.

In addition to the usual access by roads for motor trucks, the building is served by a complete system of standard gage railroad track, the main branches of which traverse the interior of the building in both longitudinal and transverse directions.

The major portion of the exterior walls consists of windows providing natural light and ventilation for the various working spaces. In addition, the craneway is lighted with an ingenious system of monitor sash.

The three-story portion is served with two industrial elevators which permit the rapid transfer of raw stock and fabricated work from the various specialty departments to the industrial railway for rapid distribution throughout the yard.

Another of the unusual features is the provision made for the comfort and convenience of employees, while working, by the installation of wood block flooring in the specialty shops. The entire building is supported on creosoted wood piling, more than 35,000 piles being required.

New Matson cargo liner Hawaiian Merchant and her sister Hawaiian Shipper are propelled by De Laval steam turbines

De Laval Equipment on Matson Ships

On page 36 of this issue will be found an interesting article describing the way in which Matson Navigation Company has gone "all out" for National Defense. The De Laval Steam Turbine Company is proud of the part its steam turbines and gears are having in this splendid achievement.

This participation began in 1927 when the Matsonia was built. In this ship De Laval installed the largest sets of two-pinion, single reduction gears then placed in an American ship. These gear sets each transmitted 12,500 shp. The Matsonia, to date, has covered approximately 1,380,000 nautical miles and these gears show practically no wear.

In the new Matson cargo liners Hawaiian Merchant and Hawaiian Shipper, each vessel is driven by a De Laval main propelling unit rated at 8500 shp at 85 rpm propeller speed. The turbines are of the cross-compound type and drive through double reduction gears. They receive steam at 440 lb. gage, 740° F., and exhaust to a 28½-inch vacuum.

The ahead turbine is of the impulse type, having eleven stages in the high-pressure casing, and seven stages in the low-pressure casing. The high-pressure turbine runs 5012 rpm, and the low-pressure turbine 3459 rpm, at 85 rpm normal propeller speed.

These turbines are designed for 10 per cent overload continuously, and 25 per cent overload for two hours.

The water rate is guarantted at 6.97 lb. per shp when developing 8500 shp, and the fuel rate at 0.6 lb. per shp for all purposes based on 18,500 Btu oil.

We are informed that on the trials of these vessels the guarantees were considerably bettered. At normal speed on the trials of the Hawaiian Merchant, the fuel rate for all purposes worked out at better than 0.55 per shp hour, with steam at 430 psi gage, and 773° F., exhausting to a vacuum of 29.41 inches hg.

The gear casings of the main propelling units on these ships are constructed of cast iron and welded steel, so split as to make the bearings and rotating parts accessible. The low-speed gear has a welded steel center, with forged steel rims, the pitch diameter being 155.75 inches.

De Laval auxiliary equipment on each of these ships includes: two 300 kw turbines, each driving a three-wire, compound-wound, 120-240 volt Crocker-Wheeler generator. The turbines run at 10,000 rpm, taking steam at the pressure and temperature in the main steam supply line and exhaust to the same vacuum as does the main unit. The steam consumption of the turbo-generators is guaranteed not to exceed 14.25 lb. per kw hour at full load. De Laval gears reduce the turbine speed to 1200 rpm for the generator.

Each ship has also a De Laval-IMO lube oil service pump, which draws from a sump tank located beneath the reduction gears and delivers through strainers and coolers to gravity tanks. This pump is rated at 325 gpm against 40 lb. discharge pressure, with 16.3-in. mercury suction lift.

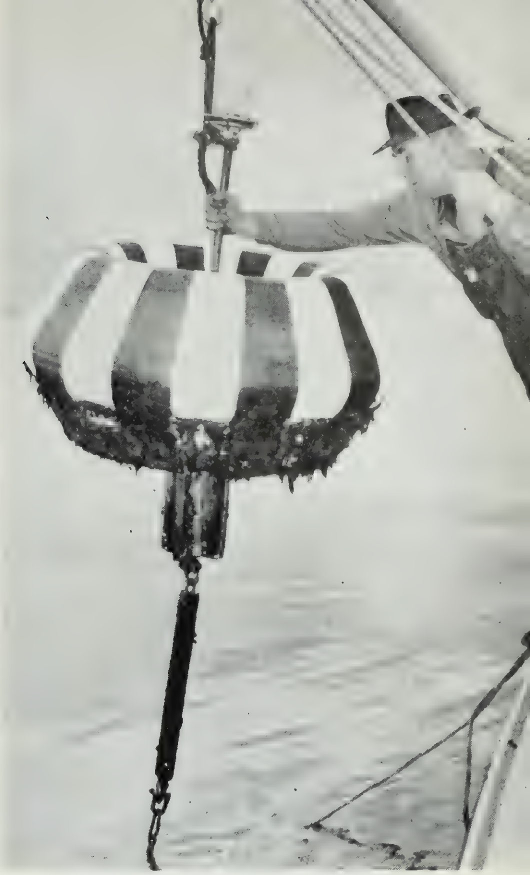
The De Laval-IMO fuel oil transfer pump is rated at 225 gpm of 450 SSU fuel oil when running at 870 rpm, with 50 lb. pressure on the discharge and 5 lb. suction lift.

The De Laval-IMO fuel oil burner pump is designed to discharge 14.4 rpm against 350 to 400 lb. pressure, with 5 lb. suction lift.

Hawaiian Planter and Hawaiian Packer are each equipped with two De Laval-geared, turbine-driven, 300 kw generators, the turbines running at 5650 rpm and the generators at 1200 rpm. These ships each have a De Laval main motor-driven centrifugal circulating pump.

Keep Posted!

Recent Development in Ship, Yard and Dock Equipment



A seadrome contact light being pulled up for inspection. Note Micarta link between basket and chain

Micarta Stops Galvanic Action

At an experimental installation in San Francisco Bay during the development of Westinghouse seadrome contact lights, engineers found that these floating buoys could not be securely moored in position with iron chains. It was learned that the uppermost links in the iron chains were eaten away and the buoys released.

Investigation further revealed that "galvanic action" had taken place in the bronze "eye" of the metal basket which houses the battery case and lamp assembly, thus causing the separation from the iron anchoring chains.

Ship chandlers reported that galvanic action could be prevented by use of a connecting link of lignum vitae, hard tropical wood, or a rope link between bronze and iron. Such a solution, however, immediately posed another problem: lignum vitae used under sea water must be replaced at intervals. It may be infested and eventually eaten away by the teredo. Rope links last only a year or less.

Westinghouse engineers decided to try industrial Micarta, a laminated plastic molded from sheets of cloth impregnated with phenol-formaldehyde resin. They sawed strips two inches wide and 18 inches long from ¾-inch plate; affixed U-shaped metal yokes—bronze at one end of the strip and iron at the other—to the experimental "links," and thus separated bronze and iron members of the buoy assembly.

After 8 months' service, the buoys were raised recently and the Micarta link examined. The plastic was found to be undamaged, although literally covered with marine growth, barnacles and teredos. Galvanic action had been stopped.

New Protective Coating for Tankers

A new protective coating, called Resistal M-600, is being introduced to the marine market by the Chemical Research Corporation. This protective coating, which dries within an hour, has been tested for a period of five years on the interiors of oil storage tanks used for storage and treatment of crudes wtih high brine, hydrogen sulfide and sulphur dioxide content.

It is ideal for long life protective qualities applied to interiors of tankers used for transport of either crude or refined petroleum products. Resistal M-600 shows excellent resistance to weak and strong acids and weak and strong alkalies; there is no embrittlement of the film due to aging; water has no effect on the dried film; immersed in cold water or subject to 80 per cent relative humidity for 24 hours. there is no water absorption. Resistal M-600 is insoluble in all petroleum hydrocarbons.

This protective film will not decompose unless subjected to dry heat in excess of 150° C. It is flexible and shows excellent adhesion to all clean metal surfaces. There is no loss of time due to drying; three coats may be applied in three hours and a tanker may be placed in service after an overnight drying period.

Resistal is not flammable. It has a dielectric strength (ASTM method) of 2300 volts per mil. and a specific surface resistivity of 2000. These dielectric factors act as perfect elimination for electrolysis.

Coatings may be applied by either the brush or the spray method.

(Page 108, please)

A Micarta link after 8 months service in sea water. The sea bugs cannot injure the link

On the Ways—

SHIPS IN THE MAKING

LATEST NEWS FROM AMERICAN SHIPYARDS

The New Shipbuilding Program

Production of 566 additional merchant ships and construction of sufficient additional facilities in existing shipyards to meet the needs of the expanded program are covered by provisions of the Supplementary Appropriation Bill which carries the appropriations of $698,650,000 and authorization for later appropriation of $1,000,000,000.

Immediately following the signing of the bill by the President, the Maritime Commission announced that preliminary negotiations had been conducted with shipbuilding companies, resulting in immediate allocation of some of the construction work.

Additional ways, together with the necessary shops, equipment and machinery which are estimated to cost an average of $1,000,000 per way, have been allocated as follows:

South Portland Shipbuilding Co., South Portland Me.—two

Bethlehem Steel Co., Sparrows Point, Md.—two

Alabama Shipbuilding and Dry Dock Co., Mobile, Ala.—eight

Ingalls Shipbuilding Co., Pascagoula, Miss.—two

Delta Shipbuilding Co., New Orleans, La.—two

Consolidated Steel Corp., Ltd., Los Angeles, Calif.—four

Richmond Shipbuilding Corp., Richmond, Calif.—three.

Expansion of existing shipyards will be authorized until sufficient capacity has been provided.

Construction of 66 ships of the

Merchant Shipbuilding on the Pacific Coast

Figures taken from Bulletin of American Bureau of Shipping

PUGET SOUND DISTRICT:	No. and Type	Gross Tons
Seattle-Tacoma Shipbuilding Corp., Tacoma Plant	2 C-1-B	12,800
	36 C-3	320,400
Lake Washington Shipyards	1 Survey ship	1,300
S. E. Sagstad	1 Survey ship	180
Total Puget Sound	40 ships	333,680
COLUMBIA RIVER DISTRICT:		
Oregon Shipbuilding Corp.	43 EC-2	292,400
SAN FRANCISCO BAY DISTRICT:		
Bethlehem	2 C-1-B	12,800
	1 Oil barge	500
Moore	21 C-2	155,700
Pacific Dry Dock & Repair	1 Oil barge	500
Pacific Coast Engineering Co.	1 Towboat	75
Richmond Shipbuilding Corp.	24 EC-2	163,200
Todd-California Shipbuilding Corp.	30 British	204,000
Western Pipe & Steel Co.	2 C-1-B	12,800
	23 C-3	204,700
Total San Francisco Bay	105 ships	754,275
SOUTHERN CALIFORNIA:		
California Shipbuilding Corp.	55 EC-2	374,000
Consolidated Steel	10 C-1-B	64,000
Total Southern California	65 ships	438,000
Grand Total Pacific Coast	253 ships	1,820,975

This gross tonnage is 31 per cent of total building in the United States as of August 1, 1941. It is considerably larger than the total gross tonnage building in the U. S. on August 1, 1940. San Francisco Bay alone now has more ships building than the whole United States had in January, 1939.

No naval shipbuilding is included.

Since the above table was compiled, Consolidated Steel has been awarded 26 C-1 cargo steamers.

On August 23 the C-2 cargo motorship Lightning slides down the ways at the Sun Yard, Chester, Pennsylvania

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Manufactured of Carbon Moly Steel; with tensile strength of 90,000 lbs. per square inch. Tested to 3 times the stated working pressure—metal thickness from 1/4" to 1/2" over specifications—made to meet A.P.I., Marine, Steam, and various other standards. A.S.A. Standards B16E—1939. Steel Specification ASTM A157-C1.

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*NOTE: STAINLESS STEEL FITTINGS MADE TO ORDER.

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Consolidated Steel Corp., Ltd. **Los Angeles, Calif.**	**26**	**C-1 type**
Gulf Shipbuilding Corp. **Chickasaw, Mobile, Ala.**	**16**	**C-2 type**
Ingalls Shipbuilding Corp. **Pascagoula, Miss.**	**10**	**C-3 type**
Bethlehem Steel Co. **Sparrows Point, Baltimore, Md.**	**14**	**C-3 type**

standard "C" types of Commission-design have been allocated according to table herewith:

These ships will cost from $2,200,000 to $3,000,000 each. Exact type of the remaining 500 ships has not been fully determined. Ultimate decision depends on the available supply of types of propelling machinery.

Another problem is the availability of steel. This will govern to a great extent the proposed further expansion of the existing ship construction program.

The entire estimated cost of this additional shipbuilding program, exclusive of the construction of new facilities, is set up in the appropriation bill in the amount of $1,246,650,000. In addition, the sum of $350,000,000 is appropriated to charter, purchase, requisition, maintain, repair and operate ships.

Addition of the ships contemplated under this appropriation bill to those in the existing Maritime Commission program brings the total planned production by the end of 1943 up to nearly 1400 ships, an average of about two ships a day.

Commission Launches Two More

Two more new merchant vessels of the Maritime Commission's 500-ship, long-range program were launched Saturday, August 23.

The Motorship **Lightning,** a diesel engined C-2 cargo ship of 9625 deadweight tons (8800 gross tons) was launched at the yard of the Sun Shipbuilding and Dry Dock Company, Chester, Pennsylvania. The sponsor was Miss Roberta Quirk, daughter of Mr. and Mrs. Robert E. Quirk of Chevy Chase, Maryland. Mr. Quirk is a Washington attorney, and was formerly chief examiner for the Interstate Commerce Commission.

This is the second new ship to be named after the famous American clipper of the 1850's, the first one of that name having been renamed **Mormactern,** and was recently acquired by the United States Navy. Lightning is the first of five identical ships being built for the United States Lines at the same shipyard.

The S. S. **African Meteor,** a C-3 passenger-cargo vessel of 10,230 deadweight tons (9975 gross tons) was launched at the yard of the Ingalls Shipbuilding Corporation, Pascagoula, Mississippi. The sponsor was Miss Therese Murray, daughter of Mr. and Mrs. J. B. Murray of Southampton, Long Island. She is being built for the American South African Line and is identical with two other ships under construction for this operator at the same shipyard.

These ships make a total of 126 launched in the Commission's long-range program.

Army Invites Bids For Target Ships

The Quartermaster Corps invited bids during August for the construction of several armored target ships of a new type for assignment to the Air Corps to be used in the training of long-range heavy bombardment squadrons in actual operations at sea, the War Department announced recently.

The vessels are to be armored sufficiently to withstand the impact of standard practice bombs dropped from any altitude attainable by modern aircraft. They will be approximately 175 feet in length, with a beam of 30 feet and will be manned by crews of approximately 50 men each. They will be good sea-keepers, capable of operating far at sea for indefinite periods.

Development of these vessels is the result of experimental work carried on in the United States and abroad during recent years. The Army Air Corps has conducted experiments with small boats, both manually and radio-controlled, for target purposes.

These ships will compare in speed and track, or maneuvering ability, with naval vessels.

Navy Takes Rio Ships

The motorship Rio Hudson, first of four new combination passenger-cargo ships being constructed at the Sun Shipbuilding & Dry Dock Co., Chester, Pa., was delivered to the United States Navy for conversion purposes August 1. Its three sister ships, Rio Parana, Rio De La Plata, and Rio De Janeiro, also have been acquired by the Navy.

C-3 passenger-cargo steamer African Comet, sister of the Meteor, just after launching at Ingalls Yard, Pascagoula, Mississippi

Puget Sound To Steer Emergency Ships

All of the 312 EC-2 Emergency Type cargo steamers, now building by the Maritime Commission, will be steered with steam steering engines built on Puget Sound, according to an announcement made on August 28.

George Gunn, Jr. and Thomas J. Bannan, present owners of the Webster-Brinkley plant, announced that they had been awarded a contract to build 252 of these steering engines for the Commission at a cost of $2,250,000. As the Sumner Iron Works at Everett already had a contract to build 60 of these engines, the new award makes the score 100 per cent for Puget Sound.

Mr. Gunn, a Seattle industrialist, and Mr. Bannan, head of the Western Gear Works of Seattle, purchased the Webster-Brinkley plant early this year. It was pretty much run down and had on the books only $10,000 in orders. The plant has been modernized and an aggressive business campaign started. Today, with this steering engine order, the back log is up $3,500,000.

The four Rio ships were designed by the Maritime Commission's technical staff as a modified type of its C-3 Passenger-Cargo vessel of 9000 deadweight tons; overall length 492 feet; passenger accommodations 196; diesel engine propulsion; and sea speed of about 16½ knots.

The ships were originally ordered for the purpose of supplementing the service of the three larger steam passenger liners, Argentina, Brazil, and Uruguay, of the American Republics Line—known as the "Good Neighbor Fleet," operating between North Atlantic United States ports and Brazil, Argentina and Uruguay.

The Rio Hudson is the 101st ship to be delivered in the Commission's 500-ship, long-range program, of which 283 have been ordered to date.

Deaerators For Texas Tankers

Each of the Texas Company's four new tankers being built by Sun Shipbuilding & Dry Dock Company will be equipped with a Cochrane marine deaerator of atomizing design as a feed heating stage.

The principle of deaeration by atomization was developed expressly for shipboard use and assures removal of dissolved oxygen from the boiler feed regardless of roll, pitch or list of the

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ship. Maximum efficiency in the use of fuel and heat is obtained by heating the feed water to the exact temperature of the saturated steam in contact with it.

BOX SCORE OF SHIPS ALREADY ORDERED

Ships Ordered	*Keels Laid*	*Ships Launched*	*Ships Delivered*
Standard-Type Ships			
393	156 as of 7/30/41	123 as of 7/30/41	100 as of 7/30/41
Emergency-Type Ships			
312	27 as of 7/30/41		

Commission Deliveries Reach Century Mark

The one-hundredth ship in the Maritime Commission's 500-ship, long-range program was delivered to its operator on July 30. Up to July 25, 97 ships had been completed, and, with two others scheduled for delivery on that day, the century mark was reached with the third delivery on July 30.

The three ships delivered were:

The M. S. American Builder, a C-1 cargo ship of 8975 deadweight tons (6779 gross tons) delivered by the Western Pipe & Steel Co., San Francisco, California, to the United States Lines Company of New York City on July 25.

The S. S. Corsicana, a tanker of 15,500 deadweight tons (9600 gross tons) and a liquid cargo capacity of 129,000 barrels, was delivered by the Bethlehem Steel Co., Sparrows Point, Maryland, to the Socony-Vacuum Oil Company of New York City on July 25. This is the first of a group of six identical tankers, with National Defense features being built by this company.

The S. S. Stella Lykes, a C-1 cargo ship of 9398 deadweight tons (6797 gross tons) was delivered by the Bethlehem Steel Co., Staten Island, New York, to the Lykes Bros. Steamship Company, Inc., of New Orleans, Louisiana, on July 30.

All Tanker Bids Rejected

Bids were opened on August 11 by the Maritime Commission for the construction of 16 small tankers.

Known as coastal tankers, the vessels were to have been about 1830 tons deadweight and have a capacity of 12,800 barrels, with an overall length of 220 feet, a beam of 37 feet, depth of 14 feet 6 inches; and with single-screw propulsion, direct diesel drive. Expected speed was to be 10½ knots.

Bids were received from nine shipyards and ranged from $600,000 per

MARINE DEPARTMENT
AETNA INSURANCE CO.
QUEEN INSURANCE CO.
MARITIME INSURANCE CO., LTD.
FIDELITY PHENIX FIRE INS. CO.
Commercial Hull Dept.
AUTOMOBILE INS. CO.

MATHEWS & LIVINGSTON
Marine Underwriters
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ship for six ships to $1,495,000 per ship for six ships.

All bids were rejected by the Commission and negotiations for better prices are in effect.

York Plan Practicable

An ordnance order amounting to approximately $2,000,000 has just been awarded by the Army to the York Ice Machinery Corporation as prime contractor under the "York Plan" of pooling men and machines for cooperative community defense work on large Government contracts. This plan has been widely publicized and recommended by OPM and NAM officials as a pattern for other industrial communities throughout the country.

The Army needs a number of 6-inch Barbette guns for harbor defense at undisclosed points. This type of gun is protected by an armored hood. When bids for the gun carriages were asked for several months ago, the York Ice Machinery Corporation brought home the plans and immediately consulted with executives and engineers from the S. Morgan Smith Company, A. B. Farquhar Co., Ltd., Brandt-Warner Manufacturing Company, Read Machinery Company and other York firms.

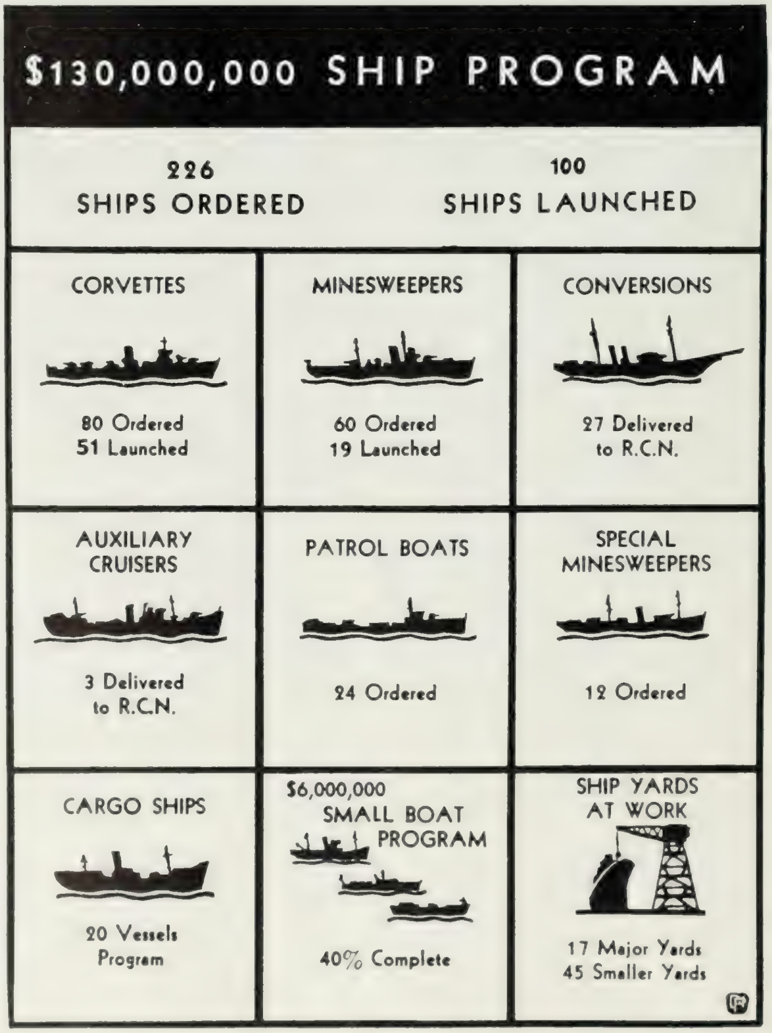
After studying the plans and carefully checking available machinery and manpower in York and neighboring communities, this group of men decided they could handle the job and were shortly able to produce an exact estimate of materials and primary and sub-contract work. The bid was submitted to Army ordnance officials through the York Ice Machinery Corporation as prime contractor and accepted.

Fireman's Fund Record for Age

Fireman's Fund Record, the oldest fire insurance house magazine in the United States, has just gained further recognition as the fourth oldest of all house organs in the nation. This announcement, following a two - year study of the field by the Paper Makers Advertising Association, is made in the July issue of *Direct Advertising*, a quarterly published in Boston by the Association.

Fireman's Fund Record was published first in January, 1878, under the name of *Insurance Items* and in 1880 was changed to its present name. Except for approximately three years, following the San Francisco fire and earthquake in 1906, the *Record* has been issued continuously, making it over sixty-one years old.

Popular among agents and brokers, employees and other friends of the fire and casualty companies of the Fireman's Fund Group, the *Record* has a monthly circulation of over 16,000. Its present editor is W. Stanley Pearce, secretary of the group of companies.



An interesting pictorial chart of Canada's Shipbuilding Program

Running LIGHTS

Who When Where

Meet Dan Pratt!

The publishers of Pacific Marine Review are gratified to announce the opening of a permanent branch office in the Pacific Northwest in charge of an experienced staff member who will devote complete attention to covering the editorial, news, advertising and service departments of this journal.

Headquarters are located at Suite 1006, Lowman Building, Seattle, and will be in charge of Daniel L. Pratt, contributor of many features as well as a news column during the past year. Mr. Pratt is well known in the marine field of the Coast, having been editor and publisher of *Pacific Motor Boat* for many years and also a contributor to numerous marine as well as industrial and economic magazines. With his long and varied experience in the marine field, he is in unusually good position to serve this journal, as he is acquainted with manufacturers both east and west, knows their processes, products, markets and marketing problems and methods.

He is also well acquainted with the numerous factors in the shipping and shipbuilding fields all along the Pacific Coast, but especially in the Pacific Northwest where he has made his home for many years.

We feel certain that marine manufacturers, both coastwise and national, seeking information about markets or needing service in that field, will find our new Pacific Northwest branch willing and eager to serve them effectively and understandingly.

Daniel L. Pratt

United States
Maritime Commission
August 19, 1941

Pacific Marine Review
San Francisco, California

Gentlemen:

This will acknowledge receipt of your card of August 1, 1941, notifying me that my subscription to the Pacific Marine Review will expire in September, 1941.

There is enclosed herewith a check for two dollars and fifty cents ($2.50) for a two-year renewal of my subscription to your magazine.

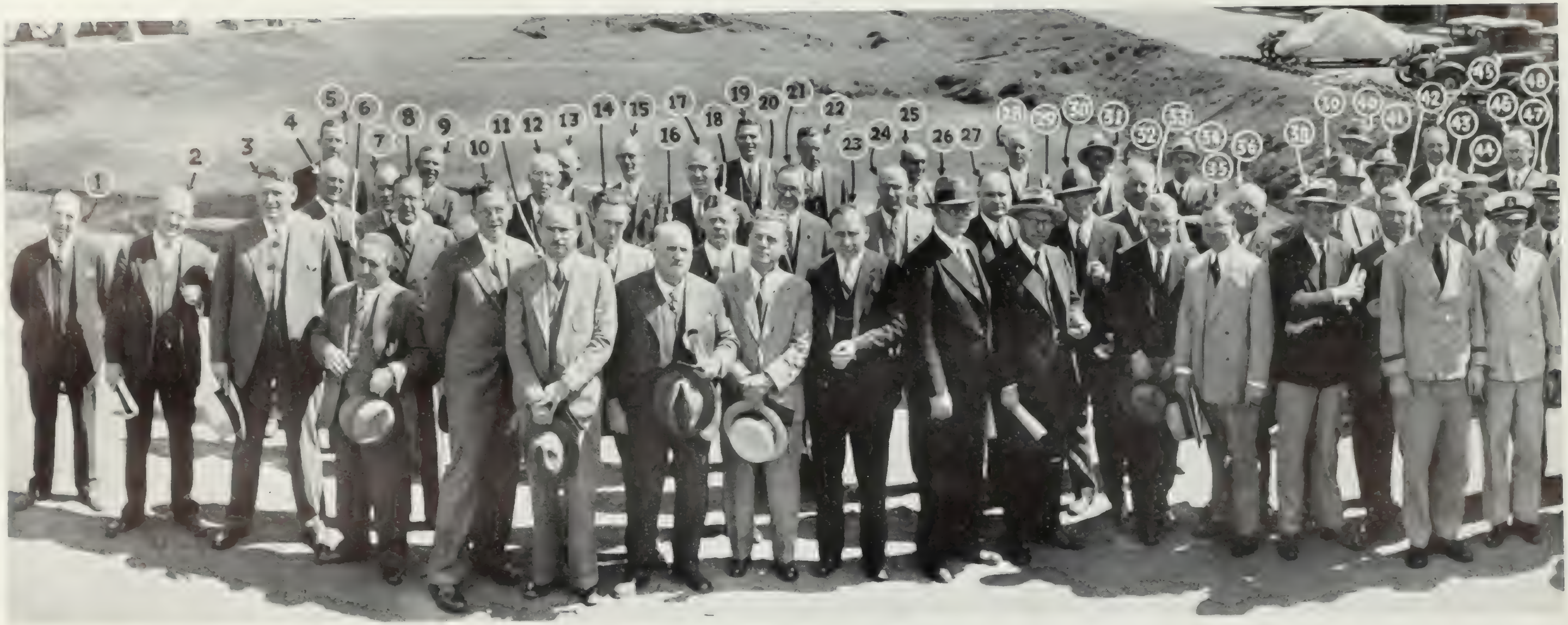
Very truly yours,
James L. Bates.

T. W. Moffit, Jr., formerly district freight agent in Los Angeles for the McCormick Steamship Company, became associated in August with the Associated Freight Lines.

◆

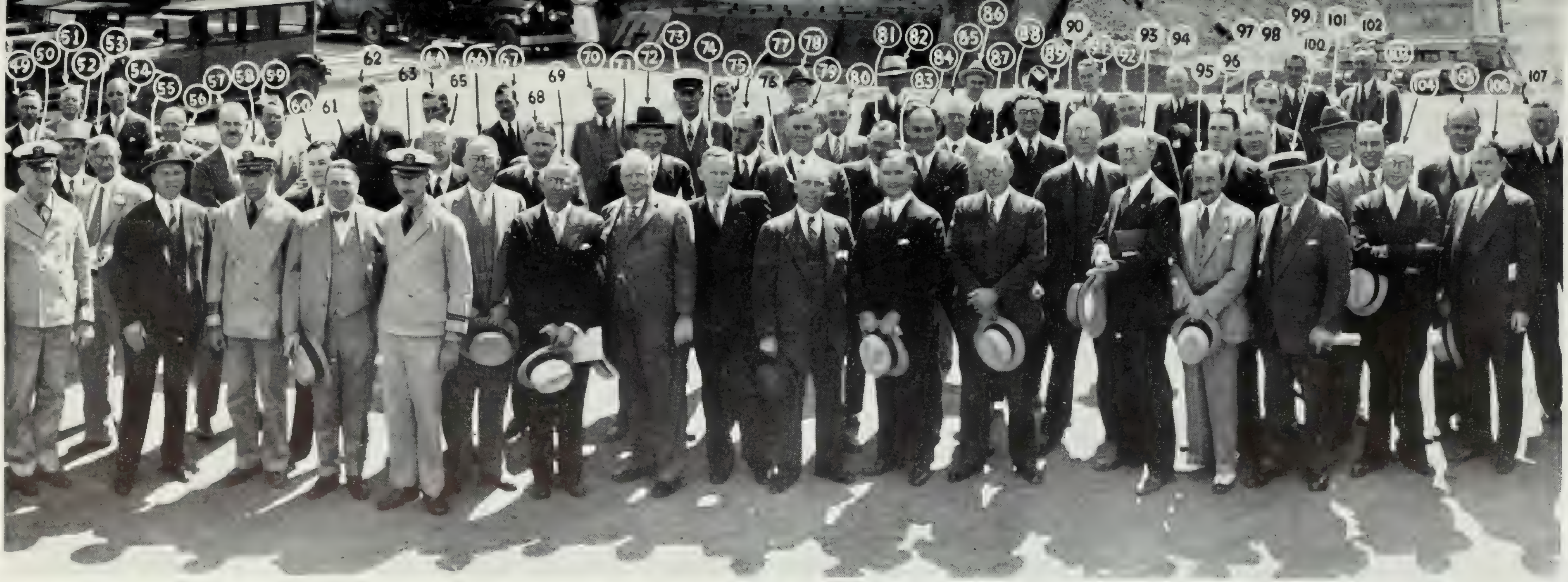
Prior to officiating at the dedication of the Maritime Commission training school at Hueneme, California, **Captain Edward Macauley,** the only West Coast member of the Maritime Commission, was guest of honor at a luncheon held by the Los Angeles Chamber of Commerce on August 29 at the California Yacht Club.

During his first official visit to Los Angeles, Captain Macauley inspected the shipbuilding plants in that district.



Nine Years Ago! Priceless photographic record of your maritime friends . . . San Francisco's keymen of shipbuilding, ship-operating, marine insurance, marine-supply and allied businesses . . . on August 30th, 1932, when members and guests of The Mariners Club of California attended the luncheon and inspection of the California Nautical School at California City. You will recognize scores of your old shipmates. Here's your key:

1-Tommy Dee. 2-Ray Jones 3-Tom Munroe. 4-Capt. J. A. Rumsay. 6-Nat Levy. 8-Jim Hines. 9-Jim Cronin. 10-H. B. Bolton. 11-P. S. Williams. 12-James Burns. 14-O. MacDonald. 15-Phil Harding. 16-Capt. La Praik. 17-Wm. Pastelwaite. 18-H. E. Coyle. 20-Eddie MacFarlan. 21-Eugene Winter. 22-Eddie Harms. 23-Perrin Truitt. 24-George Swett. 25-Bill Macdonald. 26-Ed Ramey. 27-John Dodds. 29-Capt. Wm. Tooze. 31-Bill Reed. 32-A. C. Piercy. 33-Al Short. 35-Barney Levitin. 39-Al Porter. 41-Chris Christensen. 42-Capt. Tom Hunter. 43-Exec. Officer M. E. Crossman. 44-Ben Foster. 46-Alex Dickie. 49-Bert Anderson. 50-Chief Engineer Dwyer. 52- Capt. A. F. Pillsbury. 53-Capt. C. W. Saunders. 54-C. C. Mallory. 55-John Rohlfs. 56-John Greany. 58-Capt. Emil Topp. 59-Hugh Brown. 61-Capt. Edelman. 62-Charlie Rice. 64-Fletcher Monson. 68-Walter Walsh. 69-Andy Robertson. 71-J. H. Hind. 72-Capt. Thomas Makes. 74-Freddy Cordall. 76-Ollie Langton. 77-George Wayland. 78-Ray Gunzel. 81-Graham Smith. 83-Eddie Martin. 84-Bern De Rochie. 86-Russ Pratt. 87-John Cordes. 88-Carl Nordling. 92-Capt. Francis Edwards. 93-Tom Preston. 94-George Kaufman. 96-Tom Forster. 101-Max Orisch. 102-Frank De Pue. 105-Stanley E. Allen. 107-Capt. Cy Meek. 108-Jack Cassidy. 111-Chas. H. Robertson. 114-Dr. Arthur O'Neill. 115-Harry Hiviside. 117-Bill Cathcart. 118-Dean Goldberg. 119-Harry Long. 120 Al Becker. 122-Vernon Showell. 123-Ed Finney. 125-Warren Taylor. 127-Capt. John Bolger. 128-Joseph A. Moore. 130- Jos. A. Moore, Jr. 133-Capt. P. Cushing. 134-Capt. H. D. Clark. 135-Capt. Gay. 136-Philip A. Coxon. 137-Paul Faulkner.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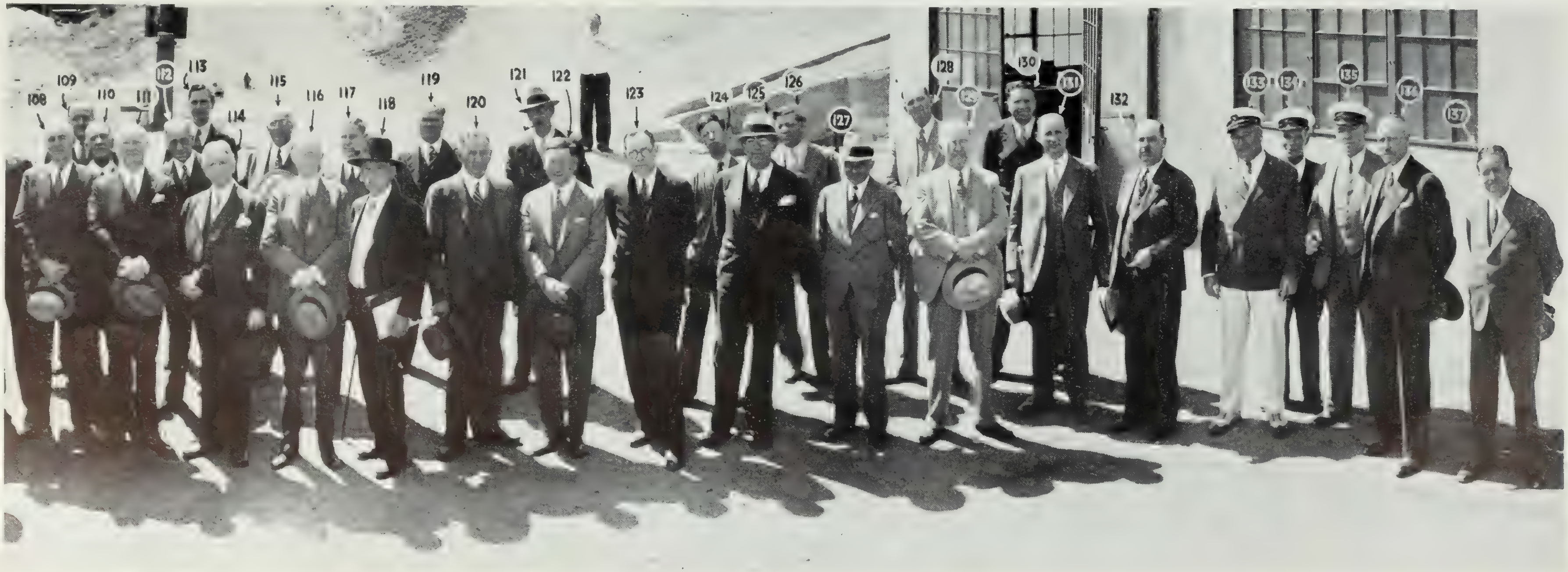
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Many a plan has been formulated . . . and executed . . . since this photo was taken early this year at the "Kick-Off" meeting at San Francisco, when Honorary President Arthur M. Tode (right) came out to aid and abet San Francisco Propeller Club President, Charles L. Wheeler and General Convention Chairman Edward H. Harms (center)

Colorful San Francisco Welcome

awaits Propeller Convention and Marine Conference

Glamour and romance of the early California days will prevail during the celebration of the fifteenth annual national convention of the Propeller Club of the United States and the American Merchant Marine Congress which will be in session for a week in this city starting October 20.

Sponsored and supported by eighty-two units of the organization in the ocean, gulf and river ports of the United States and Hawaii, one thousand delegates will come with their relatives and friends to participate in the largest and most important maritime congress ever staged in the United States and the first held on the West Coast.

As special planes, trains and automobiles from various parts of the United States arrive, greeting groups, headed by Joseph F. Marias, president of the California State Board of Harbor Commissioners, and Fred L. Doelker, vice president of the Grace Line, co-chairman of the reception committee, will extend typical and colorful San Francisco welcome.

Program for the receptions includes bevies of girls attired in colorful costumes symbolic of various periods in the history of California to be on hand with bouquets of the Golden State's flowers. Also in the role of greeters will be the Municipal Band, and gaily costumed horsemen typifying the early era of this state.

While assurance has been given Chairman Edward H. Harms that

1000 delegates will be present, advance information and reservations from others of the marine industry throughout the United States indicate that between 2500 and 3000 persons will converge on this seacoast city for the convention.

An outstanding feature of this year's annual national convention of the Propeller Club of the United States and the American Merchant Marine Conference to be held in the Hotel Fairmont, October 21 to 24, will be the marine exhibition of American steamship services, shipbuilding facilities, machinery and equipment used in the construction and operation of vessels.

William Radner of the Matson Navigation Company, who is chairman of the exhibits for the fifteenth annual gathering of the American marine industry, announces that the marine exhibition will be one of the outstanding features of the convention.

PROPELLER CLUB OF THE UNITED STATES
PORT OF SAN FRANCISCO, CAL.

Shipbuilders will be afforded an opportunity of presenting to the 1000 delegates and an equal number of visitors, the major part the shipbuilding industry is playing in the upbuilding of the American Merchant Marine and the perfection of our National Defense.

Chairman Radner reports that the reservations already made by the leading industrialists assure the manufacturer of, and dealer in, marine equipment a fine opportunity to present the latest in marine engineering progress and products to the executives and heads of operating departments of shipbuilding and vessel operating companies.

A commanding area of space amidst an attractive setting has been arranged for the exhibit. To date 25 concerns throughout the country have made reservations for their products.

The United States Maritime Commission through Chairman Admiral E. S. Land was one of the first to reserve space. Others announced to

These Workers make all ready and shipshape

Fred Doelker
Joe Marias
Arthur Poole

Walter Hill
Eddie Martin
Cap. Mesherry
Dad Le Count

Joe Lunny
Bill Radner
Bob Fouke

Mac Cremer
John Davidson
Cap. Blackstone
Bob Lillevand

The Port of San Francisco

Charles L. Wheeler
President

John E. Cushing
First Vice-President

Arthur B. Poole
Second Vice-President

Hugh Gallagher
Third Vice-President

Eugene F. Hoffman
Secretary-Treasurer

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A. S. Gunn
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George Jordan
Roger D. Lapham
Marshall Levis
Ira S. Lillick
Capt. Lewis Mesherry
Joseph A. Moore
Arthur B. Poole
Charles L. Wheeler

TO ALL PROPELLER CLUB MEMBERS:

Plans are now being completed for the great American Merchant Marine Conference and Fifteenth Annual Convention of the Propeller Club of the United States to be held in San Francisco, October 21-24, 1941.

From all indications, this will be the largest—and in view of the present conditions, the most important—gathering of men interested in the advancement of the American Merchant Marine to be held in many years. History repeats . . . and again the value of American ships for commerce and national defense is again being brought forcibly to the consciousness of the public. We are building a new American Merchant Marine, not only to meet the demands of the present, but to provide adequate shipping facilities for the future.

We urge all members of the Propeller Club to plan to be in San Francisco and to lend their support in our long range program furthering the American Merchant Marine for our economic and national defense.

Yours for American Shipping

T. A. Scott, *President*
The Propeller Club of the United States

J. L. Luckenbach, *Chairman*
American Merchant Marine Conference

date include: United States Lines, Moore-McCormack Lines, Inc., General Electric Company, Edwin H. Fitler Company, C-O-Two Fire Equipment Company, Babcock & Wilcox, Pacific Marine Review, Tubbs Cordage Company, Atlantic, Gulf and West Indies Steamship Lines, Fairbanks-Morse Company, Westinghouse Electric & Manufacturing Company, Radio Marine Corporation, *The Log*, William Powell & Co., Foster-Wheeler Corporation, Ray Oil Burner Company, Garlock Packing Company and American Export Lines.

ON TO HAWAII

Many Propeller Club members, their wives and families who attend the American Merchant Marine Conference and the Fifteenth Annual Convention of the Propeller Club of the United States will make a post-convention tour to Hawaii, sailing on the Matson liner Matsonia on Friday, October 24, to spend nine days in the nation's "Paradise of the Pacific." Reservations may be made at any office of the American Express Company.

Sailing from San Francisco on October 24, the Matsonia will call at Los Angeles for a day, then steam through the peaceful waters of the Pacific on a 4½-day voyage to the nation's island territory.

How those 4½ days will be spent aboard ship before arrival in Hawaii is best told by an outline of what facilities are offered aboard the luxurious queen of the Pacific. The Matsonia is 582 feet long, with over 17,000 gross tonnage and a speed of better than 22 knots per hour. The liner has almost a mile of deck space on two main promenades, plus the deck above for tennis, shuffleboard, walking and other games. The Matsonia has an indoor swimming pool, and gymnasium completely outfitted with everything athletic.

For those who like to loaf, the Matsonia has a well-stocked library which subscribes to the latest books, magazines, newspapers and periodicals. In the liner's immense main lounge bridge parties, teas and bingo games are played. The panelled bar and men's lounge for cocktails, smoking and after theatre snacks, is one of the most popular places aboard ship.

Dancing is held nightly in the Matsonia's "Crystal Palace," a spacious ballroom in the upper-forward part of the ship. Movies and bingo games alternate during the nights at sea to provide entertainment for all. On the last night on the Pacific before arriving in Honolulu, an "Aloha Dinner" is given by the ship's captain for all passengers. The Propeller Club members will, like other convention groups, most likely stage a masquerade ball on that night.

Arriving in Honolulu on October 30, Propeller Club members, their wives, families and friends will be taken to the Royal Hawaiian or Moana hotels at world-famed Waikiki Beach to begin the nine-day holiday in Hawaii. On specially arranged tours, the Propeller Club members, accompanied by members and wives of the Honolulu Club, will tour the Island of Oahu, locale of Honolulu.

Around Oahu, the motorcade will see the breath-taking view from Nuuanu Pali, where, two hundred years ago, King Kamehameha tossed his enemies over the cliff to win the last battle which brought all the Islands under one ruler. It was almost a century later before Hawaii was peacefully annexed to the United States to become a Territory.

Oahu, with its windward shore, its rugged volcanic mountain peaks, its vast sugar farms, beaches, and the fortifications at the nation's greatest Army post, Schofield Barracks, and the Navy's impregnable Pearl Harbor operating base, is the principal island in the Territory.

Running Lights of Convention and Conference

Upper left: Arthur M. Tode, Honorary President and upper right: Capt. Thomas A. Scott, President, Propeller Club of the United States

Lower left: Charles H. C. Pearsall, Vice Chairman and lower right: J. Lewis Luckenbach, Chairman, American Merchant Marine Conference

Center is Ben Barker, vice chairman Resolutions Committee

But other islands, linked together by twice-daily plane service and daily steamer service, must be seen in order to appreciate the full beauty and native charm of the Islands.

Back in Honolulu, Propeller Club members will ride the surf at Waikiki, go swimming in Waikiki's famed waters, dance under the stars in the shadow of Diamond Head, go shopping in Honolulu's quaint down-town shops and curio stores and in the modern emporiums of Polynesia. Honolulu is just a 10-minute ride in speedy trolley-buses to Waikiki. Fine estates line the shores of Waikiki, such as the "Shangri-La" of Doris Duke Cromwell and the modernistic home of the Henry J. Toppings, for Honolulu is a "city of homes," from the high reaches of Wilhelmina Rise to the cool depths of Manoa and Nuuanu valleys.

After a banquet and farewell party to be staged by the Honolulu Propeller Club, the party will bid "Aloha" to new-found friends to sail aboard the liner S. S. Lurline, flagship of the Matson fleet of four great white passenger ships, on Friday, November 7.

Remembering the colorful arrival, with the Royal Hawaiian Band playing "Aloha Oe" and vocalists and instrumentalists presenting the harmonies of Hawaii, and hula girls dancing and presenting visiting Propeller Club members with flower leis, it would seem that nothing could be more exciting. But the departure of the S. S. Lurline, carrying Propeller Club members back to the mainland, will outdo any and all expectations for the spectacular. Laden with flower leis, the visitors will follow the usual custom and throw their flower leis overboard so that their wish to return will be fulfilled when the flowers float back to the shore.

Another 4½-day voyage aboard the Lurline, with all the shipside pleasures repeated, and the party arrives back on the mainland in San Francisco on Wednesday, November 12, and in Los Angeles on the 14th.

Jim Castle defines A Salesman

James B. Castle, Pacific Coast manager for Lunkenheimer, has just returned from a very busy trip to Portland and Seattle and other Northwest ports of call, reporting that business up that way is hitting a new all-time high!

Jim is in a position to make comparisons with the hectic shipbuilding days of 24 years ago. He has countless friends from these first boom days as well as among the present-day shipbuilders who have come into the picture out on the Coast.

Somewhere along the line, Jim captured the following treatise which your reporter regards as a classic standing out above the volumes which have been written about SALESMEN . . . like an arc light in the fog.

Your reporter acclaims it as well worth your attention, and here it is:

Definition of a Salesman

A salesman must be a superman, a man of vision and ambition, an after dinner speaker, before-and-after dinner guzzler, night owl, able to work all day and drive all night and appear fresh next day, learn to sleep on the floor and eat two meals a day to economize on traveling expenses so he can entertain his friends in the next town.

Must be able to entertain customers, wives, sweethearts, and pet stenos without becoming too amorous; inhale dust, drive through snow 10 feet deep at 10 degrees below, and work all summer without perspiring or acquiring B. O.

Must be a man's man, a ladies' man, a model husband, a fatherly father, a good provider, a Plutocrat, Democrat, Republican, or New Dealer, an old dealer and a fast dealer, a technician, politician, mathematician & mechanic.

Must be a sales promotion expert, create a demand for obsolete merchandise, be a good credit manager correspondent, attend all dealer meetings, tournaments, funerals, visit customers in hospitals and jails, contact all accounts every six weeks, in spare time look for new business, do missionary work, and attend factory sales conferences.

Must have unlimited endurance, and frequent over-indulgence in wine, women, wind and gab, a wide range of telephone numbers in all principal cities. Must have a car, attractive home, belong to all clubs, pay all expenses at home and on road on 5% commission, plus 2% excise tax, 1% old age pension, and 2% lost sales tax.

Must be an expert driver, talker, liar, dancer, traveler, bridge player, poker-hound, golf player, diplomat, financier, capitalist, philanthropist, and authority on palmistry, chemistry, psychology, dogs, cats, horses, blonds, brunettes, redheads, etc.

THE CADET CORPS
OF THE
CALIFORNIA MARITIME ACADEMY
OPERATING THE TRAINING SHIP
CALIFORNIA STATE

18 August 1941

Bernard De Rochie
PACIFIC MARINE REVIEW
San Francisco

Dear Mr. De Rochie:

Enclosed herewith is the 1941 issue of the Handy Billy.

On page 38, you will find the advertisement for which you so graciously subscribed. We trust this is to your complete satisfaction.

The Cadet Corps wishes to take this opportunity to thank you for your interest in their activities.

Respectfully,
PAUL S. MEAD
Business Manager.

PTA Golf Tourney

Traffic men of the San Francisco range went athletic in a big way on the August 9th week-end when members, friends and relations caravanned to Sonoma Mission Inn. E. F. Mitchell of Morton Salt Company was our "staff photographer" for the event and we are indebted to him for the accompanying snaps.

ON THE
FACING PAGE:

Upper left: HERB WALMSLEY *of General Steamship and his wife. Center: Lester B. Raymond, president of the PTA and secretary-treasurer of Overland Freight Transfer Co. Right:* GORDON ROWLEY, *District Freight Agent of McCormick Steamship Company—and his "first mate." Lower left:* ED MITCHELL *and his spouse. Ed is Traffic Manager for Morton Salt Co. Center: Assistant Traffic Manager of K Line,* K. S. FINNESSEY *and* MRS. K. S. *Right: Some of the boys in action!*

Up at the top of this page—the lone golfer is GORDON ROWLEY, *the low net winner of the tournament practising sans golf ball. In the top view, right, "Champ" Rowley, coached by two members of his foursome, now has a ball . . . and is getting ready to take off. The man mountain on the right is* HERB WALMSLEY, *who came out high gross winner. Center shot shows the all-star quartet teeing-off on the memorable flight*

Lower picture shows the finish, ONE MAN DOWN!

AMERICA'S NEW MERCHANT MARINE
is WORTHINGTON EQUIPPED

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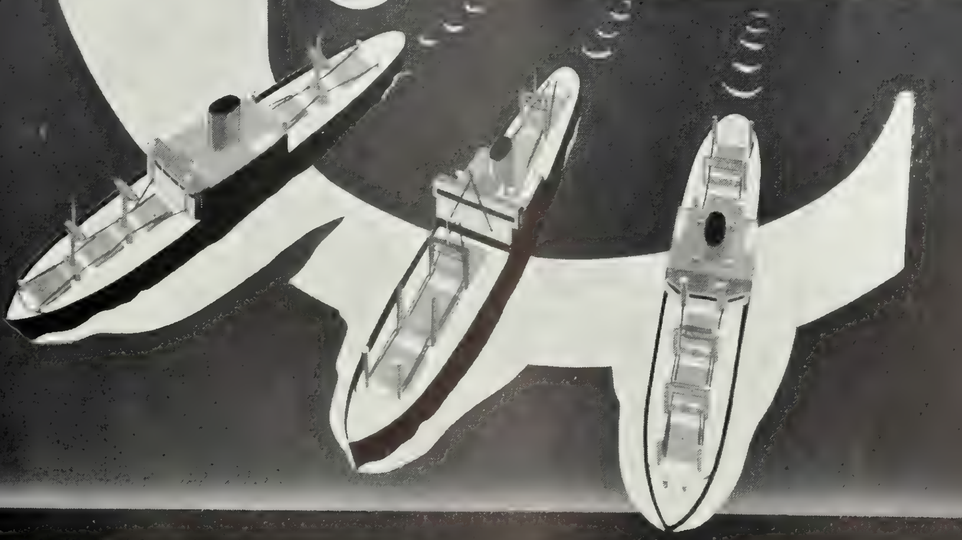
ON THE C-1 BOATS . . . Vital auxiliaries, on more than 90 percent of these vessels, are Worthington.

ON THE C-2 BOATS . . . Both Diesel and geared turbine . . . also equipped with Worthington auxiliaries.

ON THE C-3 BOATS . . . Both cargo and passenger, Diesel and geared turbine . . . Worthington pumps, air compressors, feedwater heaters, main and auxiliary condensers.

Thus, as in every national emergency for a century, Worthington products go to sea in America's defense.



WORTHINGTON

WORTHINGTON PUMP AND MACHINERY CORPORATION GENERAL OFFICES: HARRISON, NEW JERSEY

Grace Official to New Executive Post

James E. Magner, assistant vice president and freight traffic manager of the Grace Line, has been made vice president in charge of passenger traffic, it was announced recently by R. R. Adams, executive vice president of Grace Line.

Mr. Magner has been associated with W. R. Grace & Company and the Grace Line for the past 25 years. For the past 13 years he has been freight traffic manager. Mr. Magner has served in India and other foreign posts for the company and prior to his appointment as assistant vice president and freight traffic manager, was for ten years in the Operations Department of the line.

He started his business life as an office boy and copy runner for B. C. Forbes, financial writer of the New York *American*. He served his apprenticeship with W. R. Grace & Company and Grace Line as a mail boy, and after that was transferred to the steamship chartering division in the European department, thus beginning his experience in the operating end of the steamship business.

After this he was assigned to India with the old Atlantic & Pacific Steamship Company and in 1920 he joined the Operations Department of the Pacific Mail Steamship Company which operated an intercoastal and round-the-world service. In 1925 he joined the staff of the Panama Mail Steamship Company and was placed in charge of freight traffic, later becoming the general freight agent.

In 1928 Mr. Magner was appointed freight traffic manager of the Grace Line and the Panama Mail Steamship Company. Since then he has handled the steadily growing operations of that department in the company's Central and South American services.

As vice president in charge of passenger traffic, Mr. Magner will have charge of all passenger traffic in the New York-West Coast of South America service of the Grace Line, together with the New York-Caribbean-South America service.

James F. Magner

New President for Cramp Shipbuilding

At a special meeting of the board of directors of the Cramp Shipbuilding Company, Rear Admiral William G. DuBose, U.S.N. (Ret'd) was elected president of the company to succeed Mr. James Reed who died July 23.

In addition to assuming the duties of president, Admiral DuBose will continue to act as chairman of the executive committee.

The newly appointed Cramp executive was born in Charlottesville, Virginia, September 20, 1876. He was appointed to the U. S. Naval Academy by Congressman J. C. C. Black, 10th Georgia District, in 1893. In June of 1897, he was graduated number one in his class, and then took a two-year post graduate course in naval architecture at the Naval Academy.

From that date until his retirement as rear admiral in 1940, experience in the construction corps of the Navy has been especially notable. In 1920 he was awarded the Navy Cross "for distinguished service during the World War, as Construction Officer of the U. S. Atlantic Fleet and later in connection with fitting and repairing vessels, and equipping them with mine-protecting devices."

It is an interesting coincidence that the first ship to which he was assigned in 1897 was the armored cruiser New York, built at the old Cramp Shipyard. He can look from his present office and see the ways from which this famous flagship of Admiral Sampson's was launched. He served on the New York in the Battle of Santiago during the Spanish-American War. At the end of the war, he returned to the Naval Academy at Annapolis for a post graduate course in Naval Construction. This course was started under Naval Constructor Richmond Pearson Hobson, who sank the Merrimac at the entrance of Santiago Bay. Part of the post graduate course covered short tours of duty at the Cramp Shipyard.

On August 1, 1937, he was promoted to the rank of rear admiral. In 1939 he served as director of David W. Taylor Model Basin at Carderock, Maryland, and in 1940 was made liaison officer for the Navy Department with the Advisory Commission to Council of National Defense.

On October 1, 1940, he was placed on the retired list of the Navy, and was offered and accepted the high executive post with the Cramp Shipbuilding Company.

A Great Combination

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on the Pacific Coast

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125 W. Eighth Street
—San Pedro 5474—

LOW PRESSURE EVAPORATORS: Get engineering data and prices quickly from our Coast agents . . . 12 to 100 t/d capacity . . . Produce, from every pound of 5 lb. waste steam, .9 lb. of distilled water, single effect; 1.65 double effect; 2.5 lb. triple effect.

HEAT EXCHANGERS DESIGNED AND BUILT . . . Steam condensers . . . steam jet air ejectors . . . feedwater heaters . . . lube oil coolers . . . fuel oil heaters . . . jacket water coolers . . . ammonia, CO_2 and Freon coolers—these are regular, standard products of Condenser Service & Engineering Company.

MAINTENANCE: Services include the retubing, rebuilding and cleaning of condensers and all heat exchange equipment. Feedwater and evaporator coils carried in stock at all points of representation. Tubes, tube sheets and all types of packing available. *Speed in Emergencies.*

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For true Economy
Let your buy-word be . . .

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MARINE PAINTS . . .

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Anti-Corrosive
Boottopping
Cabin Paints
Deck Paints

Deck House Paints
Hold Paints
Red Lead (Mixed)
Smoke Stack Paints
Topside Paints

Federal takes care of all your painting needs. There are Federal paints for the interiors of your ships . . . paints and protective compositions for your decks and hulls . . . there is a Federal product for every use aboard ship . . . from keel to truck.

We invite you to consult with the Federal agent in your district when you are planning your next painting job.

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100 Bush St. EXbrook 3302-3

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The Federal Paint
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33 Rector Street, New York, N. Y.

San Francisco plans for Navy Day

Present at the Navy Day Committee Meeting, Army and Navy Club, Thursday, August 14, 1941, were: Walter J. Walsh, chairman; Capt. Lewis Mesherry, U.S.A. Ret.; Lt. Comdr. James Brenner, U.S.N.; Lt. Owen Atkinson, U.S.N.R.; Captain Cyril Meek; Ben Foster; Ensign J. Odell, U.S.N.R.; Lt. Comdr. Julian Ducray, U.S.N.R.; L. M. Gould; Captain Murphy.

Committee appointments have been made as follows:

Yacht Race Committee: Capt. Cyril Meek, chairman; Ben Foster, vice chairman.

Speakers' Committee: Lt. Comdr. J. Brenner, U.S.N.

Publicity Committee: Jerry Scanlon.

Ball Committee: Capt. Lewis Mesherry, U.S.A., Ret.

Sea Scout Committee: L. M. Gould.

Merchant Marine Committee: Captain S. E. Allen.

Enlisted Men Committee: Comdr. Howard McKinley, U.S.N.

C. C. Thomas Navy Post: V. Bevers.

White Squadron Post Veterans of Foreign Wars: G. E. Reed.

Fleet Naval Reserve Assn.: Wm. J. Slamon.

Naval Academy Graduates Assn.: Capt. K. H. Donavin.

Naval Reserve Officers Assn.: Julian Ducray.

Dewey Medalmans Assn.: C. J. Dutreaux.

General discussion was entered into and tentative plans were discussed for the coming Navy Day.

It was proposed that, in addition to the bird boat races this year, races be arranged for the Farallon type boat. It was decided that there must be a minimum of at least three boats in this race, or no race.

In regard to the Speakers' Committee, it was decided that in order that all speeches made this year will be in harmony with the Navy Department program, Lt. Comdr. James Brenner would take charge. In view of the rush schedule that the Navy Department has at this time, and the large volume of work it has to accomplish, there will be no parade this year. In lieu of a parade, an extra effort will be made to have the stores decorate their windows for Navy Day.

Plans were tentatively set up for Admiral Greenslade to be the speaker at the Navy Day luncheon, which will be held as usual this year. As in the past, this luncheon will be under the joint sponsorship of the Navy League of the United States, the Army and Navy Club, the C. C. Thomas Navy Post of the American Legion, the White Squadron Post of the Veterans of Foreign Wars, the Naval Academy Graduates Association, the Naval Reserve Officers' Association, the Fleet Reserve Association, the Chanawas Club, the Mariner's Club, and other allied and affiliated organizations.

Walter J. Walsh

Howard M. Hubbard

New President for Elliott

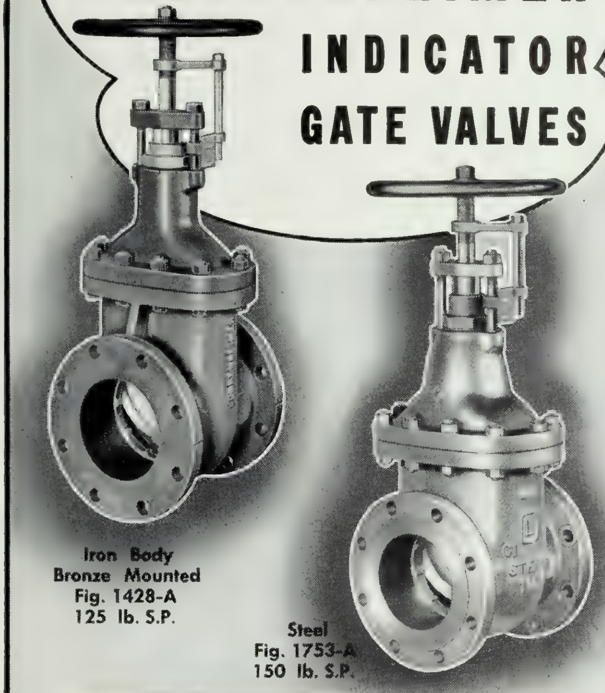
The Board of Directors of Elliott Company on August 9, announced the election of **Howard M. Hubbard** as president, effective September 1, 1941. Mr. Hubbard comes to Elliott Company from the Greenfield Tap and Die Corporation of Greenfield, Massachusetts, where he has been president and general manager. Previous to his association with that company, Mr. Hubbard served in various executive capacities with the Harris-Seybold-Potter Company of Cleveland, Ohio, one of the country's largest manufacturers of offset printing presses, paper cutting machines and allied machinery.

In 1917 Mr. Hubbard enlisted in the Second Massachusetts Regiment of the National Guard and served on the Mexican border. He later was called for World War duty and served in France with the Yankee Division. He was discharged from the Army in the spring of 1919 as a second lieutenant.

Upon his return to America, Mr. Hubbard spent a year at the Massachusetts Institute of Technology and then attended Northeastern University in Boston from which he graduated with a degree of Bachelor of Mechanical Engineering. His first business experience was in the shops of the Bullard Machine Tool Company, Bridgeport, Connecticut. This experience led to his completing his formal education with a degree from the Harvard Graduate School of Business.

In 1930, Mr. Hubbard joined the Harris - Seybold - Potter Company as comptroller. Subsequently, he assumed the additional duties of secretary and treasurer and when he resigned, was also a director of the company and managing director of the company's Seybold and Canadian divisions. Mr. Hubbard became president of the Greenfield Tap and Die Corporation about the time the Defense Program started and he was immediately faced

Don't Guess BE SURE *with* LUNKENHEIMER INDICATOR GATE VALVES



Iron Body Bronze Mounted
Fig. 1428-A
125 lb. S.P.

Steel
Fig. 1753-A
150 lb. S.P.

With perfectly guided tight-seating disc plus the indicator to clearly show open or closed position—Lunkenheimer Indicator Gate Valves provide a double safety factor for ships at sea.

They are part of the complete line of Lunkenheimer Marine Valves and Accessories regularly made and tested in accordance with the requirements of the Bureau of Marine Inspection and Navigation, the American Bureau of Shipping and Lloyd's Bureau of Shipping.

Lunkenheimer distributors are located in shipping centers everywhere. Call on them for your requirements and ask for your copy of Bulletin M-1 "Lunkenheimer Valves for Marine Service".

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THE LUNKENHEIMER CO.
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WHERE THERE'S SMOKE THERE WILL BE

A FIRE DETECTION SYSTEM that so effectively protects at all times, in all places, that a tiny whiff of smoke from a carelessly flicked cigarette will set off the audible alarm and start the C-O-TWO fire extinguishing system. The space exposed to fire is flooded with fire-killing non-injurious carbon dioxide gas. C-O-TWO* smoke detecting cabinets have signal windows for each space protected—an exclusive C-O-TWO feature.

IT'S SAFER *because* IT'S FASTER

There is a C-O-TWO fire protection system for every size boat. Whether your ship's safety requires the large multiple cylinder installations with smoke detector; hose units; portables or just a single cylinder for a landing launch, C-O-TWO offers you the fastest fire extinguishing equipment. Write today for complete information.

One of four 40 Cylinder Systems, C-O-TWO installations on the 476 ft. U. S. Army Engineers Seagoing hopper dredge, George W. Goethals.

**C-O-TWO is the registered trade mark and trade name of the carbon dioxide fire extinguishing equipment manufactured by the C-O-TWO Fire Equipment Company, Newark, New Jersey.*

C-O-TWO FIRE EQUIPMENT CO.

10 EMPIRE STREET, NEWARK, NEW JERSEY

Sales and Service in the Principal Cities
of United States and Canada

with the difficult problem of substantially increasing the company's facilities. In less than a year, the new buildings were completed and the machinery installed and the company's employee rolls increased from 1100 to 2400.

Mr. Hubbard, during his business career, has established an impressive record in the fields of industrial production, finance, marketing and management. His past experience in the manufacture of engineered products will contribute to the operations of Elliott Company who are established manufacturers of turbines, generators, condensers, centrifugal blowers and other power plant products.

Elliott Company has manufacturing plants in Jeannette, Pa., Ridgway, Pa., and Springfield, Ohio, and has maintained a district sales and service office in this city for many years. San Francisco office is under the management of F. A. Calmus.

◆

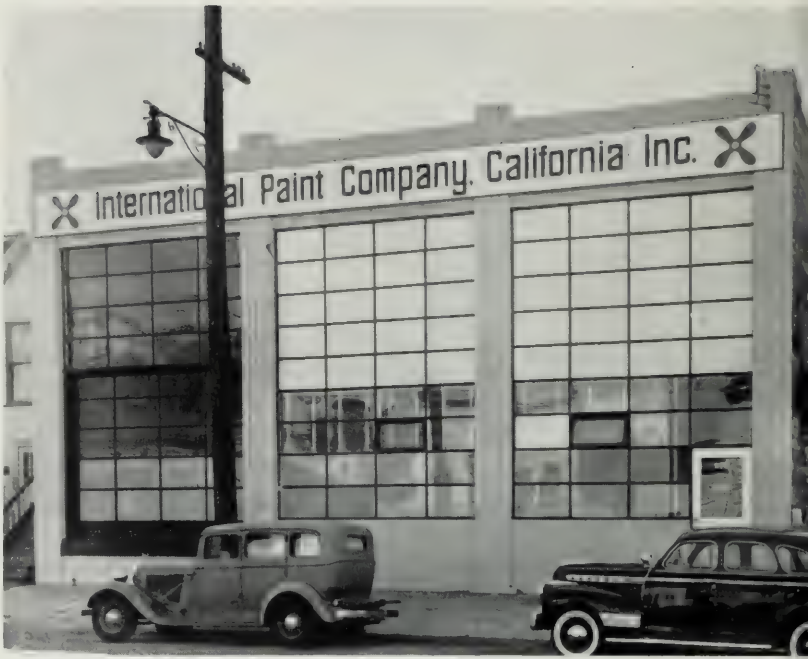
Joseph T. Scully Honored by Associates

More than 100 friends and business associates of Joseph J. Scully, assistant to the general traffic manager of Johns-Manville, honored him at a luncheon at the Hotel Commodore, New York, July 31, 1941, upon completion of his twenty-fifth year with Johns-Manville.

S. A. Williams, vice president of Johns-Manville Corporation, presented Mr. Scully with a gold watch, emblematic of membership in the Quarter Century Club, an honorary organization composed of those who have been with the company twenty-five years or more.

Mr. Scully began his career with Johns-Manville in 1916 as a clerk in the traffic department and has held various positions in that department during the past twenty-five years. He advanced to his present post after having supervised practically every kind of transportation activity at the company's New York headquarters.

Mr. Scully was organizer and second president of the Metropolitan Traffic Association of New York, Inc. He is also president of the Long Island Traffic Club, lectures at New York University on subjects dealing with transportation and is an instructor at the Academy of Advanced Traffic.



J. M. "JACK" BOND *made good on his promise to give us the "go ahead" signal wh home of International Paint Company, California, Inc., was ready for photographin we present the spacious new building, which houses offices and stocks at 970 Te Street in San Francisco . . just "one look and a go-around" from Bethlehem's Union S*

L. E. Thiefenthal, Pacific Coast manager of the Pacific and Atlantic Shippers Association, announced in August the appointment of **Clarence E. Pellerin** as assistant manager, with offices in Los Angeles.

Mr. Pellerin was formerly with Conaway & Cooper, general traffic councelors.

This picture came to us through the courtesy of J. R. Eidom, president of The Bilge Club. It shows Lloyd J. Moore, who is assistant to Arthur Woll, manager of the marine department of General Petroleum Corp. of California. Lloyd recently returned from a fishing tour of that angler's paradise up in the Pacific Northwest.

Comments Bilger Prexy Eidom: "I must assume from the picture that Lloyd is too modest to have the rest of his catch in evidence. The really big ones are purposely hidden."

In 1940 Lloyd Moore was president of The Bilge Club of Los Angeles Harbor. Aside from trout snatching, Lloyd has the foundation for a great golf game and is constantly trying to master the technique of penny-ante which, as our readers know, is another scientific pastime.

Eliminating a Wet Floor Slipping Hazard

. . . *Alundum Tile*

A STRIP of Alundum Tile replaced the original tile down the entire length of this row of ranges. Now the busy chefs have a safe, sure footing even when liquids are spilled—and the non-slip surface of the Alundum Tile will never wear slippery.

Catalog A gives full information about Alundum Tile. Write for a copy—also for Catalog B which describes Alundum Ceramic Mosaic Tile, another Norton Floors product.

* * *

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T-479

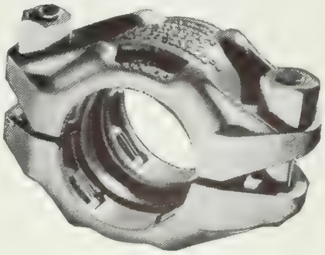
NORTON FLOORS
ALUNDUM TILES—TREADS—AGGREGATES

They TAKE IT with plenty of SALT

ROLAGRIP
Pipe Couplings

WITHSTAND CORROSION!

The waters of Laguna Madre, off the Texas Gulf Coast, are so salty that most marine life is killed. There, one of the major oil companies used Rolagrip Couplings on gas and water lines running to an off-shore oil well drilling rig — getting perfect service. These lines were later taken up, cleaned of barnacles, and installed as a surface line along the beach to conduct crude oil. A later inspection showed that after these two very severe services, the rollers of the Rolagrip Couplings were apparently unaffected and in perfect gripping condition. Proof again that Rolagrip Couplings are durable, corrosion-resisting, and money-saving connections for plain end pipe!



Dependable Deliveries...

Rolagrips are conveniently available to shipbuilders from stocks maintained at Philadelphia, Houston, Oakland, Seattle, and other points.

G-B MFG. CO.

WRITE for Brochure which gives full information on installations and economies of Rolagrips.

GUSTIN-BACON MANUFACTURING CO.
1416 W. 12th, KANSAS CITY, MISSOURI
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HOUSTON · SAN FRANCISCO

More Gleanings from Jerry Scanlon's Notebook

NICHOLAS GRAVEM

Nicholas Gravem opened a shipping and commission firm at 244 California Street, San Francisco, where his son, **Nicholas Gravem, Jr.,** is associated with him as junior partner. Mr. Gravem was a partner for twenty years with Otis, McAllister & Co. and vice president for nine years with Hind, Rolph & Co., both of San Francisco.

* * *

BAY VISITOR

P. J. Fitzpatrick, who was connected with the U. S. Government's marine engineering division down at the Canal for the last year, is now in San Francisco on vacation. He reported as being undecided whether he would return to Balboa or assume a position with one of the Bay shipbuilding concerns.

Chief Engineer **GENE CARDINETT** *keeps a watchful eye on things down below on the West Cactus*

Bernard Mills

The end of the voyage was entered on August 18 into the life-log of Bernard Mills, consulting engineer and for forty-one years employed by the American-Hawaiian Steamship Company.

Death came to the veteran as he was driving his automobile in Contra Costa County. He had been ill with a heart ailment for some time, but it was not believed critical and news of his passing was received with profound grief by relatives, friends and acquaintances.

A pioneer in the marine engineering field, Mr. Mills joined the American-Hawaiian in 1900 as first assistant engineer of the freighter Hawaiian. He was later advanced to chief engineer and subsequently came shore side as port engineer.

In 1914, Mr. Mills was promoted to the important post of marine superintendent in charge of the propulsion department of the company's operations in New York. In 1923 he returned to San Francisco in the same position. Then in 1940, Mr. Mills assumed the title of consulting engineer.

Mr. Mills was constantly interested in new ideas for marine engineering. Besides his regular duties he was instrumental in designing the first oil burners which were installed in American-Hawaiian vessels and it is recalled it was the old Nebraskan that became the first American vessel in ocean trade to burn fuel oil under boilers. In his long career many marine improvements evolved from his mechanical ingenuity.

A member of the American Society of Mechanical Engineers and the American Society of Naval Architects and Marine Engineers, Mr. Mills was one of the legion of men who unobtrusively but so successfully have advanced America's mechanical inventions and improvements to the world's leadership. Many a successful engineering leader afloat and ashore owes much of his success to the painstaking and kindly help of this veteran.

Bernard Mills

STEAMSHIP DINNER ANNOUNCEMENT

The annual Steamship Dinner is to be "blended" with the brilliant convention banquet of the national convention of the Propeller Club of the United States and the American Merchant Marine Conference this year, **Edward H. Harms,** general convention chairman has announced.

The close proximity of the steamship dinner date in the past years with that of the national convention of the Propeller Club, October 21 to 24 this year, decided the steamship men of the Port of San Francisco to make the evening of October 23rd, when the banquet takes place in the Gold Ballroom of the Hotel Fairmont, with Admiral E. O. S. Land as the speaker, an all inclusive marine gathering.

As in the past, steamship men who travel from all sections of the Pacific Coast for the Steamship Dinner will be present for this year's joint celebration.

* * *

As we go to press, words comes from **Capt. A. T. "Tom" Hunter,** president of **The Mariners Club,** that the next luncheon meeting will be held on September 10 at the St. Julian.

Guest speaker: **Lt. Commander G. M. McKeller, U.S.N.R.** His subject: "The Navy and the National Defense Program."

Says Skipper Tom: "We know that all our members will be interested in this most vital subject of the day, and we look for a full attendance."

SERVING SEVEN
★ PRESIDENTS ★

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PRESIDENT POLK
PRESIDENT HAYES
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PRESIDENT ADAMS
PRESIDENT VAN BUREN
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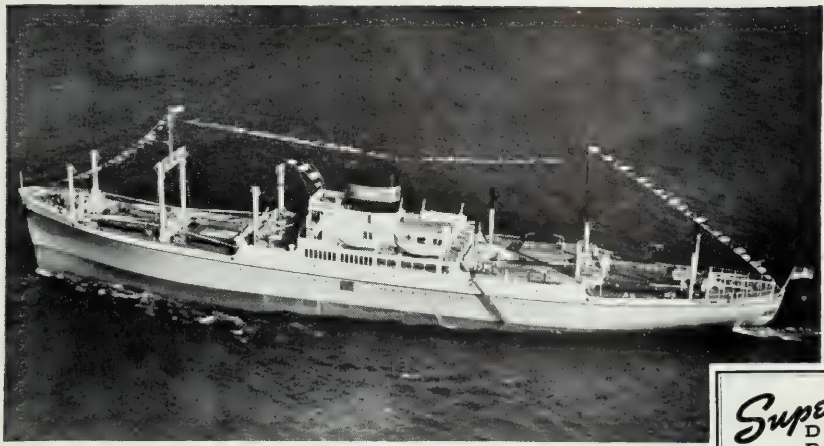
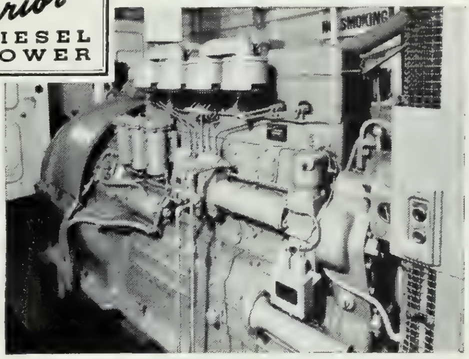


THE PRESIDENT JACKSON

Superior DIESEL POWER

Emergency Diesel generator sets on the seven PRESIDENT ships are supplied by the National Supply Company, Superior Engine Division, Philadelphia, Pa. . . . Built by the Newport News Shipbuilding & Drydock Company for the U. S. Maritime Commission, these seven magnificent combination passenger and cargo vessels will carry the flag of the American President Lines, Inc., of San Francisco.



SUPERIOR DIESEL GENERATOR SET

THE NATIONAL SUPPLY COMPANY . . . SUPERIOR ENGINE DIVISION

SALES OFFICES: Springfield, Ohio; Philadelphia, Penna.; New York, N. Y.; Los Angeles, Cal.; Jacksonville, Fla.; Houston, Texas; St. Louis, Mo.; Fort Worth, Texas; Tulsa, Okla.; Boston, Mass. FACTORIES: Springfield, Ohio; Philadelphia, Penna.

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MULTIFILM OIL HEATERS

Are of all steel construction, light weight, small in size, cleanable and many installations have proved them to be most satisfactory. They are approved for marine service and at the present time early shipments can be made.

COEN COMPANY
INCORPORATED
Combustion Engineers

SAN FRANCISCO **NEW YORK**

PROGRESS IN *American Shipyards*

★ Asterisk indicates new listings.

PACIFIC COAST SUMMARY
Seagoing Self-propelled Steel Ships

District and Shipyard	*No. and Type*
PUGET SOUND DISTRICT	
Associated Shipbuilders	4 seaplane tenders
Birchfield Boiler Co.	3 aircraft tenders
Lake Washington Shipyards	4 A. S. N. T. 1 survey ship 6 seaplane tenders
Seattle Shipbuilding and DD. Co.	4 mine sweepers
Seattle-Tacoma (Tacoma Yard)	1 C-1 36 C-3 5 TI-MT-MI tankers
Seattle-Tacoma (Seattle Yard)	25 destroyers
COLUMBIA RIVER DISTRICT	
Albina Eng. & Mach. Works, Inc.	4 subchasers
Commercial Iron Works	4 A. S. N. T. 7 mine sweepers
Oregon Shipbuilding Corp.	43 EC-2
Willamette Iron & Steel Co.	2 mine layers
SAN FRANCISCO BAY DISTRICT	
Anderson & Christofani	6 coastal mine sweepers
Basalt Rock Co., Inc.	2 fuel oil tankers
Bethlehem Steel Co.	2 C-1 25 destroyers 4 cruisers
General Engineering & DD. Co.	4 A. S. N. T. 8 mine sweepers
Moore Dry Dock Corp.	3 C-3-P 2 sub-tenders 18 C-2
Richmond Shipbuilding Corp.	24 EC-2
Todd-California SB. Corp.	30 cargo vessels (British)
United Engineering Co. Ltd	8 Navy fleet tugboats
Western Pipe & Steel Co.	2 C-1 23 C-3
LOS ANGELES DISTRICT	
Bethlehem Steel Co., Inc.	10 destroyers
California Shipbuilding Corp.	55 EC-2
Consolidated Steel Corp. Ltd.	34 C-1-BT 46 lighters 2 P1-S2-L2
Los Angeles SB. & DD. Corp.	3 repair vessels 3 seaplane tenders

Pacific Coast

ALBINA ENGINE & MACHINE WORKS, INC.
Portland, Oregon

New Construction:

Hulls Nos. 51-54, four 165′ steel submarine chasers for U. S. Navy.

ANDERSON & CHRISTOFANI
San Francisco, Calif.

New Construction:

Six 97′ AMC coastal mine sweepers for U. S. Navy.

One 48′ yacht for Herman Hogrefe. **Completed.**

One 60′ purse seiner for S. Piazza.

ASSOCIATED SHIPBUILDERS
Seattle, Wash.

New Construction:

One insulated self-propelled lighter for delivery to U. S. Navy at Puget Sound Navy Yard.

Four small seaplane tenders for delivery to Puget Sound Navy Yard.

ASTORIA MARINE CONSTRUCTION CO.
Astoria, Ore.

New Construction:

Four 135′ wooden diesel-powered mine sweepers for U. S. Navy. Delivery in 14 months.

BASALT ROCK CO., INC.
Shipbuilding Yard
Napa, Calif.

New Construction:

Twelve steel seagoing 1000-ton cargo barges; contractors, Pacific Navy Air Bases. Delivery at San Francisco Bay. 150′ x 40′ x 12′. Contract awarded November 15, 1940. **Delivery dates, first two about April 15; thereafter one every 7 or 10 days.**

Hulls Nos. 22-23, two 10,000-bbl. fuel oil tankers, for delivery to Mare Island Navy Yard. 235′ x 37′ x 19′3″; 1000-hp diesel electric; cost $1,800,000. Contract awarded by Navy Dept., Bureau of S. & A., Washington, D. C. **Keel laying dates,** No. 22, June 20, 1941; **No. 23, August, 1941.** Launching dates, No. 22, October, 1941; No. 23, December, 1941. Delivery dates, No. 22, January 30; No. 23, May 30, 1942.

New plant for Sperry

To meet the requirements of the national defense program, The Sperry Gyroscope Company has completed plans calling for the erection of a new and modern plant in the town of North Hempstead on Long Island. It is anticipated that ground will be broken within a week. Manufacturing operations are scheduled to begin early in 1942.

The new plant, to be known as the Lakeville Plant of the Sperry Gyroscope Company, will be located in Nassau County, south of the North State Parkway adjacent to the Queens County line. One hundred and twenty-one acres are included in the property.

In connection with plans for the new factory **R. E. Gillmor,** president of The Sperry Gyroscope Company, issued the following statement:

"The National Defense Program makes it imperative that Sperry provide for further expansion of our organization. After surveying all available locations the Lakeville site was selected.

"The site of the new plant is in the township of North Hempstead and the Village of Lake Success. The boards and civic organizations patriotically recognizing the national defense aspects of this expansion have promptly granted the necessary zoning permits and have given us the necessary support to allow us to proceed with our plans for construction."

Designed to be one of the most modern structures of its kind in the country, the Sperry plant will include 1,350,000 square feet of floor space. The factory building will be one story, 640 feet wide by 1440 feet long, and 16 feet in height. In addition there will be a three-story administration building. As the buildings will cover only 26 acres while a total of 121 acres are included in the property, there will be adequate space for the development of an attractive plan of landscaping, for parking areas and for recreation areas.

The new Sperry plant will be easily accessible to the air transportation facilities at La Guardia Field. The company's Garden City Research Laboratory is 8 miles away.

It is anticipated that approximately 7,000 new employees will work in the Lakeville plant. The new manufacturing facilities will not replace any of the company's existing facilities but will be in addition to all plants now in operation.

Among the company's present products are: The Directional Gyro, Gyro-Horizon and Automatic Pilot for airplanes; Searchlights, Sound Locators and Directors for Anti-Aircraft Protection; the Gyro-Compass, Gyro-Pilot and other marine instruments.

The new Lakeville plant of The Sperry Gyroscope Company will be built under an arrangement with the Defense Plant Corporation of the Reconstruction Finance Corporation. The plant will be the property of the D. P. C. and will be leased by Sperry.

MORE VENTILATION
per inch of space!
per pound of weight!
per dollar of cost!

No Wonder ORDERS KEEP FLOODING IN

Union Oil Co., Tankers 4373-74-75 . . . Bethlehem Steel Co.
C2—Cargo Boats Hulls 180-186 . . . Federal Shipbuilding & Drydock Company, Kearney, N. J.
Moore-McCormick Line. C3 Passenger and Cargo Boats. "Rio Hudson", "Rio de la Plata", "Rio Panama", "Rio de Laniero" . . . Sun Shipbuilding & Drydock Co., Chester, Pa.
Sinclair Refining Co., Tankers 15,000 Tons. Hull 1492-1493. Bethlehem Steel Co., Fall River, Mass.

Write, Wire or Phone Today for Catalog No. EB-381

ILG ELECTRIC VENTILATING CO.
2824 N. CRAWFORD AVENUE, CHICAGO, ILL.
Offices in 43 Principal Cities

ILG

Vitalized* VENTILATION
AND AIR CONDITIONING
*AIR CHANGE...NOT JUST AIR MOVEMENT!

★ **Hull No. 28, self-propelled lighter** for U. S. Navy. 132′6″ x 30′ x 12′4″; 300 hp diesel; 500 gross tons; cost $370,000. Delivery date, February 15, 1942.

★ **Hulls Nos. 29 and 34, two open lighters** for U. S. Navy. 110′ x 34′ x 11′3″; 500 gross tons; cost $216,000. Delivery date, November 15, 1941.

★ **Hulls Nos. 35-36, two open lighters** for Navy Contractors. 144′ x 40′ x 13′; 750 gross tons; cost $128,000. Delivery date, October 31, 1941.

★ **Hulls Nos. 37-38, two open lighters** for Navy Contractors. 124′ x 36′ x 10′; 450 gross tons; cost $102,000. Delivery date, November 11, 1941.

BERKELEY STEEL CONSTRUCTION CO.
Berkeley, California

New Construction:

★ **One all-welded utility diesel-electric stern wheeler** for U. S. Engineers. 102′ x 26′ x 5′. Cost $114,800.

BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Division
San Francisco Yard
San Francisco, Calif.

New Construction:

Hulls Nos. 5363-5364, two C-1 cargo vessels for U. S. Maritime Commission. 395′ x 60′ x 37′6″; 6400 gross tons each; 4000-hp. Full scantling steam propulsion type. Keel laid, No. 5364, January 15, 1941. Launching dates, No. 5363, March 12, 1941; No. 5364, July 3, 1941.

Hulls Nos. 5368-5383, sixteen 2100-ton destroyers, DD526-DD541.

Hulls Nos. 5366-5367, two 1650-ton destroyers, DD459-DD460, for U. S. Navy. Keels laid January 13, 1941.

Hulls Nos. 5390-5396, seven 1620-ton destroyers, DD605 - DD611. Keel laying dates, Nos. 5390, 5391, March 25 and 28, 1941.

Hulls Nos. 5386-5389, four 6000-ton cruisers, CL95-CL98.

BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Division
San Pedro, Calif.

New Construction:

Hulls Nos. 9001-9004, four 2100-ton destroyers, DD544-DD547.

Hulls Nos. 9007-9012, six 1620-ton destroyers, DD612-DD617. Keel laying dates, Nos. 9007, 9008, May 1, 1941; Nos. 9009, 9010, May 29, 1941.

BIRCHFIELD BOILER CO., INC.
Tacoma, Washington

New Construction:

One U. S. Coast Guard Cutter for Columbia River and Snake River.

N. J. BLANCHARD BOAT CO.
Seattle, Washington

New Construction:

One sloop, 52′ x 11½′, 50-hp gas engine.

Three 45′ aircraft tenders or rescue boats for the U. S. Navy.

CALIFORNIA SHIPBUILDING CORP.
Wilmington, California

New Construction:

Hulls Nos. 1-55, fifty-five EC-2 type cargo vessels for U. S. Maritime Commission. Seven keels laid up to July 23, 1941.

COLBERG BOAT WORKS AND STEPHENS BROS.
Stockton, Calif.

New Construction:

Three large wooden mine sweepers for U. S. Navy.

COMMERCIAL IRON WORKS
Portland, Ore.

New Construction:

Four anti-submarine net tenders.

Seven steel mine sweepers for U. S. Navy.

CONSOLIDATED STEEL CORP., LTD.
Los Angeles, Calif.

New Construction:

Hulls Nos. 156, Agwimonte; 157, Aguiprince; 158, Alcoa Pennant; 159, 222-225, eight C-1-BT, full scantling, turbine propulsion cargo vessels for U. S. Maritime Commission. Keel laying dates, No. 159, April 1; No. 222, November 3; No. 223, November 17; No. 224, December 8; No. 225, December 22, 1941. Launching dates, No. 157, March 27; No. 158, June 26; No. 159, **September 24, 1941;** No. 222, March 2; No. 223, April 6; No. 224, May 4; No. 225, June 8, 1942. **Delivery dates, No. 156, August 15; No. 157, September 29;** No. 158, November 6; No. 159, December 23, 1941; No. 222, June 10; No. 223, July 6; No. 224, August 3; No. 225, September 7, 1942.

Hulls Nos. 181-182, two Design P1-S2-L2 twin screw turbine propulsion transports for U. S. Maritime Commission. Launching dates January 5 and June 8, 1942. Delivery dates September 26 and November 5, 1942.

Hulls Nos. 162-193; 208-221, 46 steel lighters. Keel laying dates, **No. 206, August 1, 1941; No. 207, September 22, 1941.** Launching dates, No. 206, February 9, 1942; No. 207, May 5, 1942. Delivery dates, No. 206, November 8, 1942; No. 207, November 5, 1942.

FELLOWS & STEWART, INC.
Wilmington, California

New Construction:

One 100′ V-bottomed kelp harvester.

Two 45′ taxi boats.

F. L. FULTON
Antioch, Calif.

New Construction:

Six 97′ wooden mine sweepers for U. S. Navy.

GENERAL ENGINEERING & DRY DOCK CO.
Alameda, Calif.

New Construction:

Four anti-submarine net tenders for U. S. Navy.

Eight mine sweepers for U. S. Navy.

HARBOR BOAT BUILDING CO.
Terminal Island, Calif.

New Construction:

Ten 60-foot U. S. Navy target boats. Delivery dates, two on August 5; one on August 15, and one on August 22, 1941.

Hulls Nos. 117-120, four 136′ motor mine sweepers for U. S. Navy. Keels laid, No. 117, May 8, 1941; No. 118, May 12, 1941; **No. 119, July 15, 1941; No. 120, July 30, 1941. Launching dates, No. 117, August 23, 1941.**

HUBBARD'S SOUTH COAST COMPANY
Newport Beach, California

New Construction:

Four 45′ twin-screw aircraft tenders for U. S. Navy.

Six 135′ mine sweepers for U. S. Navy.

KRUSE & BANKS SHIPBUILDING CO., INC.
North Bend, Oregon

New Construction:

Hulls Nos. 121-124, four 135′ wooden mine sweepers, YMS type, for U. S. Navy. Cost $1,800,000.

LAKE WASHINGTON SHIPYARDS
Houghton, Wash.

New Construction:

Four anti-submarine net tenders.

Four thousand A. S. N. T. floats.

Coast and Geodetic Survey ship.

Six seaplane tenders for U. S. Navy.

AL LARSON BOAT SHOP, INC.
Terminal Island, Calif.

New Construction:

Hulls Nos. 112-113, two mine sweepers, YMS 86 and YMS 87, for U. S. Navy. Keels laid, No. 112, June 20; No. 113, July 18, 1941. Delivery dates, No. 112, November 27, 1941; No. 113, March 27, 1942.

LOS ANGELES SHIPBUILDING & DRY DOCK CORP.
Los Angeles, Calif.

New Construction:

Hulls Nos. AR6-AR8, three repair vessels for U. S. Navy.

Hulls Nos. AV 11-AV 13, three seaplane tenders for U. S. Navy.

MOORE DRY DOCK CO.
Oakland, Calif.

New Construction:

Hulls Nos. 201-203, three cargo and passenger vessels for U. S. Maritime Commission and Alcoa Steamship Co. 442′x62′x25′; depth molded to bridge deck 41′6″; 8500 hp; 17 knots speed; passenger carrying capacity 38. **Keel laying dates,** March 26, June 3 and **August 6, 1941.** Estimated delivery dates, January 1, March 15 and June 1, 1942.

Two submarine tenders for U. S. Navy.

Five submarine rescue vessels for U. S. Navy.

Six C-2 cargo vessels.

Twelve C-2 cargo vessels.

Conversion:

Hull No. 195, U. S. S. Tangier, to seaplane tender for U. S. Navy.

DOES SEA WATER ENTER HER SHAFT ALLEY?

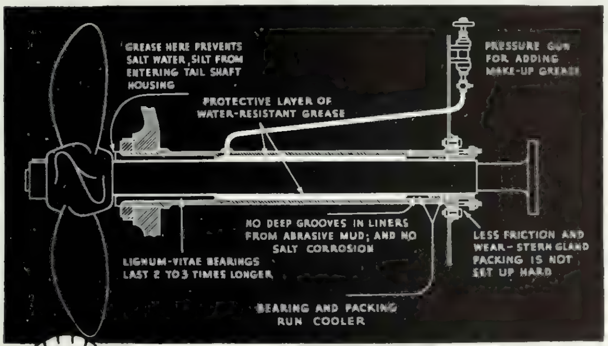
NO, SIR! NOT ANY MORE

Now bilges stay dry — thanks to Shell Stern Tube Lubrication. A simple collar of water-resistant grease between the tail shaft and the lignum vitae bushings does the trick.

But that's not all! Grease-lubricated, the bearings run cooler than before — last from 2 to 3 times as long. You save considerably on repairs and on laid-up time.

These advantages of Shell Stern Tube Lubrication are enjoyed today on more than 700 ships and boats on the West Coast.

Find out how little it costs to install this new method. Phone nearest Shell office or write to Industrial Lubricants Division, Shell Building, San Francisco, Calif.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PRESSURE GUN FOR ADDING MAKE-UP GREASE
PROTECTIVE LAYER OF WATER-RESISTANT GREASE
NO DEEP GROOVES IN LINERS FROM ABRASIVE MUD; AND NO SALT CORROSION
LIGNUM-VITAE BEARINGS LAST 2 TO 3 TIMES LONGER
LESS FRICTION AND WEAR – STERN GLAND PACKING IS NOT SET UP HARD
BEARING AND PACKING RUN COOLER

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KELVIN-WHITE SPHERICAL COMPASS

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We manufacture all kinds of compasses and binnacles, and are contractors for any and all kinds of Navigational Equipment.

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Because they are engineered from base to guard for marine service, Emerson-Electric Marine Fans are found on passenger liners, freighters and pleasure craft. Wherever cooling breezes make for comfort or better working conditions, specify Emerson-Electric Fans, with the famous 5-Year Guarantee.

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OREGON SHIPBUILDING CORP.
Portland, Oregon

New Construction:

Hulls Nos. 170-200 and 229-240, forty-three EC-2 type cargo vessels for U. S. Maritime Commission.

PACIFIC BRIDGE CO.
San Francisco, Calif.

New Construction:

One seagoing drydock for U. S. Navy. Cost $1,649,000.

PACIFIC DRY DOCK & REPAIR CO.
Oakland, Calif.

New Construction:

One all-welded steel oil barge. 148' x 38' x 9'; 300,000 gal. capacity.

Lighters. Cost $284,572.

RICHMOND SHIPBUILDING CORP.
Richmond, Calif.

New Construction:

Twenty-four EC-2 type cargo vessels for U. S. Maritime Commission.

SAN DIEGO
MARINE CONSTRUCTION CO.
San Diego, Calif.

New Construction:

Four large wooden mine sweepers for U. S. Navy.

One 65' wooden tuna boat. Launching date, July 1, 1941.

SEATTLE SHIPBUILDING AND DRY DOCK CO.
Seattle, Wash.

New Construction:

Four 136' mine sweepers for U. S. Navy.

SEATTLE-TACOMA SHIPBUILDING CORP.
Tacoma, Wash.

PLANT No. 1

New Construction:

Hulls Nos. 3, Oregon; No. 5, Idaho; two C-1 cargo vessels for U. S. Maritime Commission. Single screw, full scantling diesel propulsion type. Two General M. A. N. 2100-hp engines; 14 knots speed. Launching dates, No. 5, June 10, 1941. **Delivery dates, No. 3, August 8, 1941; No. 5, September, 1941.**

Hulls Nos. 6-7, two C-3 shelter deck type cargo steamers for U. S. Maritime Commission. To be converted on completion to U. S. Army troopships. Keel laying dates, April 21 and June 16, 1941. Launching dates, October 15, 1941, and January 15, 1942. Delivery dates, December, 1941, and March, 1942.

Hulls Nos. 8-11, four C-3 cargo ships for U. S. Maritime Commission. 492' x 69'6" x 42'6" (molded); 8900 tons; 8500-hp steam turbine propulsion; cost $2,990,000. Keel laying dates, June 18, October 22, November 1 and 5, 1941. Launching dates, November 22, 1941; February 12 and 28, and March 1, 1942. Delivery dates, No. 8, February; No. 9, May; No. 10, June; No. 11, June, 1942.

Hulls Nos. 12-16, five TI-MT-MI U. S. Navy tankers for U. S. Navy. 310'9" x 48'6" x 19'9".

Hulls Nos. 12, Patapsco; 13, Rappahannock; 14, Rio Grande; 15, Wabash; 16, Susquehanna; five TI-MT-MI tankers for U. S. Navy. 310'9" x 48'6" x 19'9'. Keel laying dates, No. 12, February 15; No. 13, March 1; No. 14, June 1; No. 15, June 1, 1942. Launching dates, No. 12, May 30; No. 13, May 30; No. 16, August 15; No. 15, August 30; No. 16, August 30, 1942. Delivery dates, No. 12, August 30; No. 13, September 1; No. 14, November 30; No. 15, November 30; No. 16, December 1, 1942.

Hulls Nos. 17-46, thirty C-3 cargo vessels for U. S. Maritime Commission. 492' x 69'6" x 42'6"; 8900 tons; 8500-hp steam turbine propulsion. Delivery dates, first, July, 1942; last, November, 1943.

SEATTLE PLANT

New Construction:

Twenty-five destroyers for U. S. Navy.

THE SHAIN MANUFACTURING CO.
Seattle, Washington

New Construction:

One 65' ferryboat for U. S. Navy.

One model 30 trimmer ship Air Flo sedan for Chas. Cole, Seattle; Chrysler Crown.

One model 36 trimmer ship Air Flo sedan for Paul Isaacson, Seattle; Chrysler Crown.

One model 50 trimmer ship ferry for Horluck Trans. Co., 110-hp Buda diesel.

One model 49 trimmer ship, express cruiser, for stock.

★ **One 50' commodore model trimmer ship** for E. Ramey.

★ **One 38' sedan trimmer ship** for U. S. Customs.

STEPHENS BROS.
Stockton, Calif.

New Construction:

Hull No. 648, cabin cruiser, for stock, 40' x 11'9" x 4'6", 110-hp twin gas engine, total cost $12,500.

Hull No. 661, raised deck cruiser for V. A. Rodden, 39'4" x 10'9" x 2'6", 140-hp twin Chrysler Royals.

Three 136' wooden mine sweepers.

TODD-CALIFORNIA SHIPBUILDING CORP.
Richmond, Calif.

New Construction:

Thirty cargo vessels for British Purchasing Commission. 10,000 dwt; 416' long, 57' beam. Cost $50,000,000. First vessel, Ocean Vanguard, **launched August 16, 1941.**

TODD-SEATTLE DRY DOCKS
Seattle, Wash.

Conversion work.

UNITED ENGINEERING CO., LTD.
San Francisco, Calif.

New Construction:

Hulls Nos. 17-20, four 205' Navy fleet tugboats, for U. S. Navy.

★ **Hulls Nos. 21-24, four 205' Navy fleet tugboats,** for U. S. Navy.

WESTERN BOAT BUILDING CO., INC.
Tacoma, Wash.

New Construction:

Hull No. 145, Anna M., live bait tuna boat. Launching date, April 5, 1941. Delivery date, September 1, 1941.

Hull No. 146, fishing boat, 95' x 24' x 11'. Keel laid April 15, 1941.

Hulls Nos. 147-148, two U. S. Minesweepers, Y.M.S. 133-Y.M.S. 134. Keel laying dates, No. 147, June 23, 1941; **No. 148, August 12, 1941.**

WESTERN PIPE AND STEEL CO.
South San Francisco, Calif.

New Construction:

Hulls Nos. 60-61, two C-1 cargo vessels for U. S. Maritime Commission. Full scantling diesel propulsion type; single screw; two Busch-Sulzer 2100-hp engines. Delivery dates, August 29 and September 13, 1941.

Hulls Nos. 62-65, 77-95, twenty-three C-3 cargo ships for U. S. Maritime Commission. 492' x 69' x 42'6"; 8900 tons; 8500-hp; steam propulsion; $2,990,000 each. Keel laying dates, No 62, April 17; No. 63, May 29; No. 64, July 17; No. 65, September 30, 1941. Launching dates, No. 62, about October 1.

WILLAMETTE IRON & STEEL CORP.
Portland, Ore.

New Construction:

Two minelayers, CM6, U. S. S. Catskill, and CM7, U. S. S. Ozark, for U. S. Navy.

Atlantic, Lakes, Rivers

ALABAMA
DRY DOCK & SHIPBUILDING CO.
Mobile, Ala.

New Construction:

Hulls Nos. 228-229, two tugs for Mobile Towing & Wrecking Co.

Hull No. 230, tug, for stock.

Hulls Nos. 231-243, thirteen all-welded Emergency cargo vessels for U. S. Maritime Commission. Cost $19,500,000.

Hull No. 244, 18,000-ton floating dock, for Todd Shipyards Corp., Galveston.

LESTER F. ALEXANDER CO.
New Orleans, La.

New Construction:

★ **Two tugs, North Star II and Trade Wind.** 68' x 17'.
★ **One all-welded steel barge,** 110'x30'x7'6".
★ **One all-welded steel barge.** 100'x28'x7'.
★ **One all-welded steel barge.** 92'x26'x6'.

AMERICAN BRIDGE COMPANY
Pittsburgh, Pa.

New Construction:

Ten freight barges for Inland Waterways Corp., St. Louis, Mo. 280' x 48' x 11'.

Eight dump scows. 160' x 50'6" x 13'6"; for Panama Canal.

Two fueling scows for Carnegie Illinois Steel Co. 125' x 26' x 11'.

Ten coal barges for stock. 175' x 26' x 11'.

Sixteen sand barges for the Panama Canal. 160' x 50'6" x 13'6".

AMERICAN CAR & FOUNDRY CO.
Wilmington, Delaware

New Construction:

Thirty-eight 45′ lighters, equipped with tanks for carrying liquids, for U. S. Navy. Total cost $1,020,262.

Four 135′ mine sweepers for Navy Dept., Bureau of Supplies and Accounts. Total cost $1,340,000.

THE AMERICAN SHIP BUILDING CO.
Cleveland, Ohio

New Construction:

Twelve net tenders for U. S. Navy; (6 at Lorain, Ohio; 6 at Cleveland, Ohio). 151′8″ x 30′6″ x 16′6″; diesel-electric propulsion; contract price $6,357,000.

Four diesel trawlers for General Seafoods Corp. 146′8″ L. O. A. x 26′0″ x 14′4″. (2 at Lorain, Ohio; 2 at Cleveland, Ohio.) Delivery date, November 15, 1941.

Eight mine sweepers (4 at Lorain, Ohio; 4 at Cleveland, Ohio) for U. S. Navy; 220′ O.A. x 32′ x 17′; diesel-electric propulsion; contract price, $13,736,000.

Two bulk freighters (at Lorain, Ohio) for Pittsburgh Steamship Company; 640′ O.A. x 67′ x 35′; geared-turbine propulsion. Delivery date, October 1, 1942.

Fifteen 2500-ihp, three cylinder triple expansion engines for Maritime Commission design EC2-S-C1 cargo vessels.

BATH IRON WORKS
Bath, Maine

New Construction:

Hulls Nos. 184-187, four cargo ships for American Export Lines. 400′ x 60′ x 39′. Delivery dates September and October, 1941, and April and June, 1942.

Hulls Nos. 188-189, DD457 and DD458, two destroyers for U. S. Navy. Delivery dates December, 1941, and February, 1942.

Hulls Nos. 190-195, DD449-451, 467-469, six destroyers for U. S. Navy.

Hulls Nos. 196-206, DD507-DD517, eleven destroyers for U. S. Navy.

Hulls Nos. 208-213; DD629-DD631; DD 642-DD644; six destroyers for U. S. Navy.

BETHLEHEM STEEL COMPANY
Shipbuilding Division
Fairfield Yard
Baltimore, Md.

New Construction:

Hulls Nos. 2001-2062, sixty-two EC-2 type cargo vessels, for U. S. Maritime Commission. Keel laying dates, No. 2001, March 30; No. 2002, May 15; No. 2003, June 21; No. 2004, June 21, 1941.

BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Division
Fore River Yard
Quincy, Mass.

New Construction:

Hull No. 1478, Massachusetts, 35,000-ton battleship for U. S. Navy. Keel laid July 20, 1939.

Hulls Nos. 1479, San Diego; and 1480, San Juan; two 6000-ton cruisers for U. S. Navy. Keels laid March 27 and May 15, 1940. Launching date, No. 1479, July 26, 1941.

Hull No. 1484, cargo vessel for U. S. Maritime Commission. 450′ x 66′ x 42′3″; 16½ knots; geared turbines and water tube boilers; 14,500 tons. Launching date November 16, 1940.

Hull No. 1487, tanker. 502′ x 68′ x 37′; 21,000 tons. Keel laid September 26, 1940. Launched June 26, 1941. **Delivered August 1, 1941.**

Hulls Nos. 1488-1491, four tankers for Sinclair Refining Co., 10,700 tons dwt. Keels laid, No. 1488, November 21, 1940; No. 1489, March 18, 1941; No. 1490, May 31, 1941. **Launching date,** No. 1488, May 29; **No. 1489, August 1, 1941. Delivery date, No. 1488, August 16, 1941.**

Hulls Nos. 1492-1493, two tankers for Sinclair Refining Co. 15,450 tons dwt. **Keel laying date, No. 1492, August 9, 1941.**

Hulls Nos. 1494-1497, four heavy cruisers for U. S. Navy. Keel laying date, No. 1494, May 26, 1941; No. 1495, June 30, 1941.

Hulls Nos. 1498-1501, four light cruisers for U. S. Navy.

Hulls Nos. 1502-1503, two light cruisers for U. S. Navy.

Hulls Nos. 1504-1507, four heavy cruisers for U. S. Navy.

Hulls Nos. 1508-1511, four aircraft carriers for U. S. Navy. **Keel laying date, July 15, 1941.**

Hulls Nos. 1513-1515, three trawlers. Keels laid, No. 1513, March 26; No. 1514,

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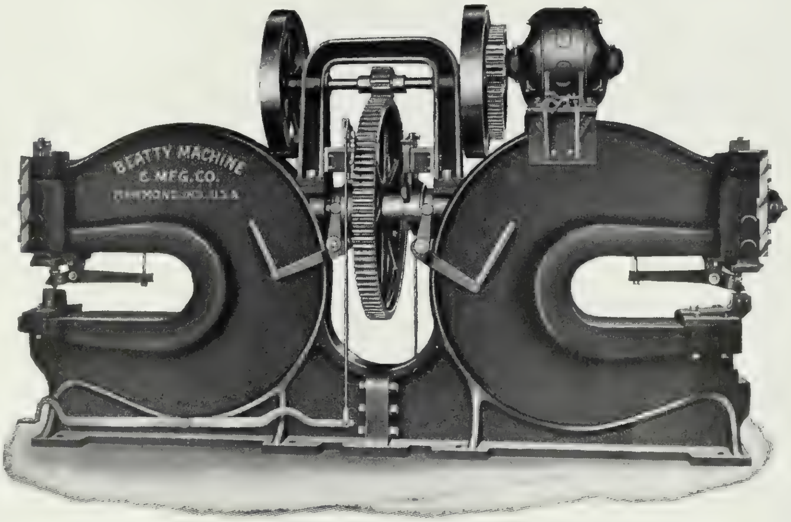

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To meet your urgent requirements, we offer a complete line of punching and shearing equipment with superior construction advantages which will satisfy the most exacting buyer who requires machines that will stand up for years with minimum attention.

BEATTY EQUIPMENT eliminates unnecessary handling through combination set ups, and large die space, thereby increasing production and reducing costs.

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Copers
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BEATTY MACHINE & MFG. CO.
HAMMOND, INDIANA

June 14; No. 1515, July 12, 1941. Launching dates, No. 1513, July 10, 1941.

Hulls Nos. 1516-1519, four 1650-ton destroyers for U. S. Navy. Keel laying date, No. 1516, May 1; No. 1517, May 20, 1941.

BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Division
Sparrows Point Yard
Sparrows Point, Md.

New Construction:

Hull No. 4348, C-1 cargo vessel. LOA 417', LBP 395', beam 60', depth 37'6". Keel laid March 13, 1941.

Hulls Nos. 4351-4352, two cargo vessels for Seas Shipping Co. 450' x 66' x 34'; 6300 hp; 8500 gross tons. Keel laying dates, No. 4351, December 12, 1940; No. 4352, January 22, 1941. Launching date, No. 4351, July 26, 1941.

Hulls Nos. 4353-4356, four oil tankers for Socony Vacuum Oil Co. 487'6" x 68' x 37'; 12,000 hp, 9800 gross tons. Keel laying dates, No. 4353, August 12, 1940; No. 4354, September 16, 1940; No. 4355, April 23; No. 4356, July 8, 1941. Launching date, No. 4353, April 19; No. 4354, July 1, 1941.

Hull No. 4357, oil tanker for Union Oil Co. of Calif. 442' x 63' x 34'10"; 3500 hp; 8000 gross tons. Keel laying date, December 26, 1940. Launched June 14, 1941.

Hulls Nos. 4358-4359, two oil tankers for Socony Vacuum Oil Co. 487'6" x 68' x 37'; 12,000 hp; 9800 gross tons.

Hulls Nos. 4360-4361, two oil tankers for Union Oil Co. 442' x 64' x 34'10"; 3500 hp; 8000 gross tons. Keel laying date, No. 4360, June 18, 1941.

Hulls Nos. 4362-4364, three cargo and passenger vessels for Mississippi Shipping Co. 465' x 65'6" x 39'9"; 8600 hp; 8300 gross tons.

Hull No. 4365, oil tanker for Richfield Oil Co. 442' x 64' x 34'10"; 3500 hp; 8000 gross tons. Keel laid May 21, 1941.

Hulls Nos. 4367-4368, two oil tankers for Panama Transport Co. 487'6" x 68' x 37'; 7000 hp; 9800 gross tons.

Hull No. 4369, oil tanker for Continental Oil Co. 442' x 64' x 34'10"; 3500 hp; 8000 gross tons.

Hulls Nos. 4371-4372, two oil tankers for Gulf Oil Co. 442' x 64' x 34'10".

Hull No. 4373, tanker for Panama Transport Co. 487'6" x 68' x 37'; 7000 hp; 9800 gross tons.

Hulls Nos. 4374-4375, two tankers for Union Oil Co. of Calif. 487'6" x 68' x 37'; 7000 hp; 9800 gross tons.

Hulls Nos. 4376-4377, two tankers for Socony Vacuum Oil Co. 487'6" x 68' x 37'; 7000 hp; 9800 gross tons.

BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Division
Staten Island Yard
Staten Island, N. Y.

New Construction:

Hull No. 8019, one C-1-B design cargo vessel for U. S. Maritime Commission.

Hulls Nos. 8021-8022, two destroyers for U. S. Navy.

Hulls Nos. 8023-8029; 8033-8035; ten destroyers for U. S. Navy.

BURGER BOAT CO.
Manitowoc, Wisconsin

New Construction:

One yacht, 65'x16'x8', Buda diesel engine.

One ferryboat, 110' x 32' x 8', 330-hp Gray diesel engine.

Six 135' wooden motor mine sweepers for U. S. Navy.

IRA S. BUSHEY & SONS, INC.
Brooklyn, N. Y.

New Construction:

Hull No. 494, tug. 90'; 805-hp F-M diesel. **Delivery date, August 15, 1941.**

Hull No. 496, tug. 90'; 805-hp F-M diesel. **Delivery date, August, 1941.**

Hull No. 497, tug. 90'; 805-hp F-M diesel. **Delivery date, September, 1941.**

Hull No. 498, 156-foot oil tanker. Delivery date, November, 1941.

Hull No. 499, 156-foot oil tanker. Delivery date, January, 1942.

Hull No. 500, wooden drydock section for Bethlehem Steel Co. Delivery date, October, 1942.

Hulls Nos. 501-502, two deck scows. 117' x 36' x 10'. Delivered August 25, 1941.

★ **Hulls Nos. 503-504, two 100' steel tugs.** 805-hp.

★ **Hulls Nos. 505-506, two drydocks,** for U. S. Navy.

★ **Hulls Nos. 507-509, three 100' steel tugs,** for U. S. Navy. 805 hp.

CALUMET SHIPYARD & DRY DOCK CO.
Chicago, Illinois

New Construction:

Hull No. 123, towboat for Ashland Oil & Refining Co., 140' x 32' x 9', 1600-hp diesel engine.

One river towboat for A. L. Meschling Barge Line, 70' x 20', 210 hp Superior diesel.

One all-welded Corten steel crawler crane barge, for U. S. Engineers Office, St. Paul, Minn., 66' x 45' x 7'.

Four all-welded distribution box boats for Quartermaster Corps., U. S. Army, 65' x 18', diesel propelled. Total cost $212,000.

Hull No. 126, all-welded steel towboat for Ashland Oil Refining Co., 145' x 32' x 9', 1600-hp diesel.

Hulls Nos. 131-132, two oil barges, standard river type, for Ashland Oil & Refining Co. 195' x 35' x 10'.

Hulls Nos. 133-135, one three-barge unit for Ashland Oil & Refining Co. Each unit, 195' x 35' x 10'; center section square on both ends; both end sections square on one end, raked on opposite end.

Hull No. 136, one river towboat for Ashland Oil & Refining Co. 245' x 32' x 90'. 1600-hp diesel.

CHARLESTON SHIPBUILDING & DRYDOCK COMPANY
Charleston, South Carolina

New Construction:

Six 205' mine sweeping fleet tugs. Delivery for all within 26 months.

CONSOLIDATED SHIPBUILDING CORP.
Morris Heights, N. Y.

New Construction:

Seven 165' steel submarine chasers for U. S. Navy.

CONSOLIDATED STEEL CORP. OF TEXAS
Orange, Texas

New Construction:

Two oil barges for C. F. Pillot, 165' x 36' x 10'3".

Six all-welded steel oil barges for Inland Waterways Corp., 196' x 35' x 10'6".

One drilling barge for Shell Oil Co., Inc., 118' x 44' x 10'.

One boiler barge for Shell Oil Co., Inc., 90' x 30' x 10'.

One transportation barge for Shell Oil Co., Inc. 80' x 24' x 5'.

Three transportation barges for Shell Oil Co., Inc. 40' x 16' x4'6".

CRAMP SHIPBUILDING COMPANY
Philadelphia, Pa.

New Construction:

Six cruisers, Cleveland class, for U. S. Navy.

DEFOE BOAT & MOTOR WORKS
Bay City, Mich.

New Construction:

Hull No. 167, PC452, sub-chaser for U. S. Navy. 174' long Delivery date, September, 1941.

Hulls Nos. 171-174, four mine sweepers for U. S. Navy, 220' long.

Twelve 174' escort vessels for U. S. Navy.

Eight 174' sub-chasers for U. S. Navy.

★ **Four 145' tugs** for U. S. Navy.

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PACIFIC PAINT & VARNISH CO.
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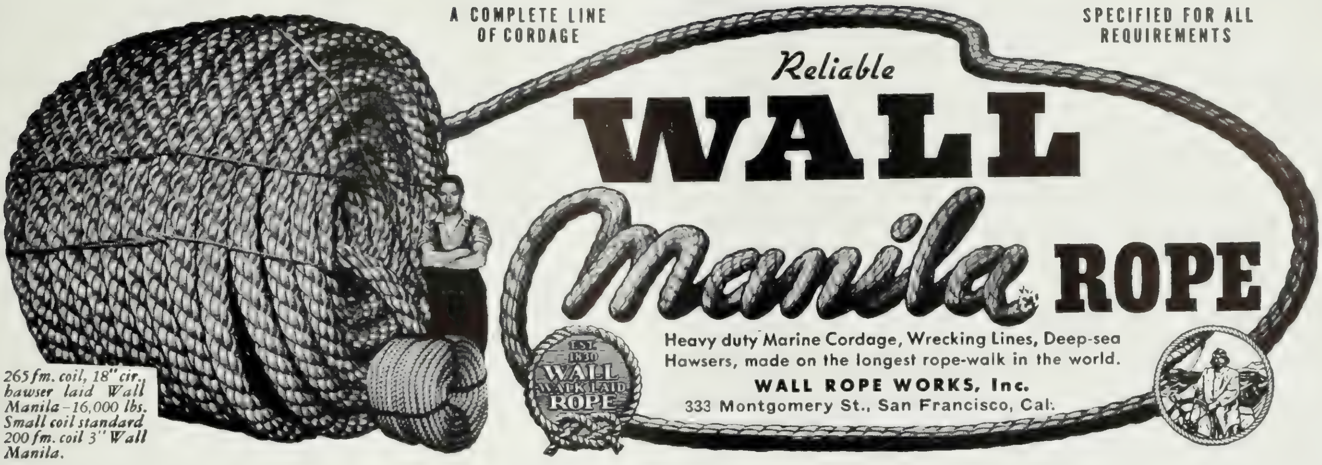

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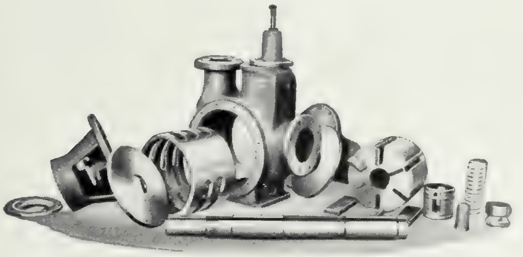

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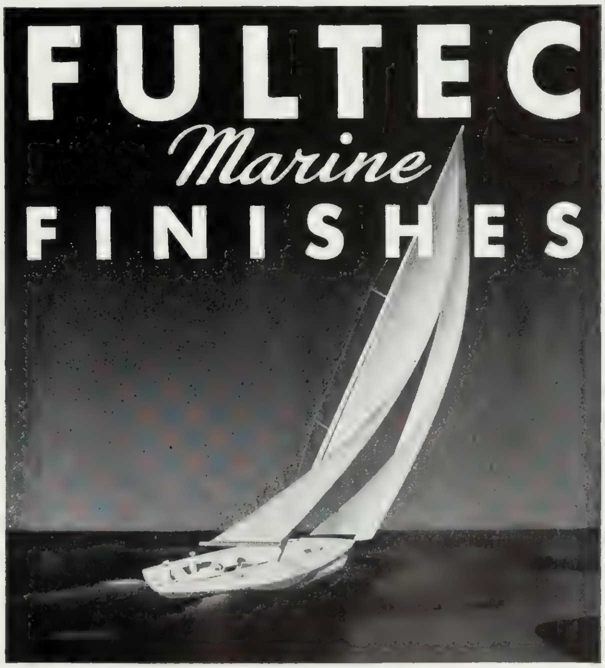
OIL CITY, PENNA.



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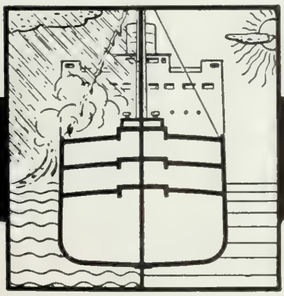

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CARGOCAIRE ENGINEERING CORP.
15 PARK ROW, NEW YORK CITY • SEATTLE, WASH.

DELTA SHIPBUILDING CORP.
New Orleans, Louisiana

New Construction:

Twenty-five EC-2 Emergency type vessels for U. S. Maritime Commission 416' x 56'10¾" x 37'4"; 2500-hp triple expansion engine.

THE DRAVO CORPORATION
Engineering Works Division
Pittsburgh, Pa., and Wilmington, Del.

New Construction:

Hull No. 1790, sand and gravel barge, for Keystone Sand Division. 135' x 27' x 8'; 255 gross tons.

Hulls Nos. 1835-1840, six 165' type PC submarine chasers for U. S. Navy, Washington, D. C. 2010 gross tons.

Hulls Nos. 1859-1861, three sand and gravel barges, for Keystone Sand Division. 135' x 27' x 8'; 765 gross tons.

Hulls Nos. 1864-1867, four welded steel oil barges, for stock. 195' x 35' 9'9"; 2392 gross tons.

Hulls Nos. 1868-1869, two 25-ton floating cranes, one each to Phil. and Norfolk U. S. Navy Yards, for U. S. Navy Dept., Washington, D. C.; 670 gross tons.

Hulls Nos. 1870-1875, six welded steel deck barges for Delaware, Lackawanna & Western R. R., 100' x 30' x 9'6"; 1392 gross tons.

Hulls Nos. 1876-1877, two floating caisson gates for U. S. Navy, Philadelphia Navy Yard; 2330 gross tons.

Hulls Nos. 1891-1902, twelve welded hopper barges for Pittsburgh Coke & Iron Co.. 175' x 26' x 11'; 5664 gross tons.

Hull No. 1903, floating caisson gate for U. S. Navy, Norfolk Navy Yard; 1330 gross tons.

Hulls Nos. 1904-1906, three welded sand and gravel barges for Cumberland River Sand Company; 130' x 24'6" x 6'6"; 579 gross tons.

Hulls Nos. 1907-1911, five 165' type AM mine sweepers for Bureau Supplies & Accounts, U. S. Navy Dept., Washington, D. C.; 1675 gross tons.

Hulls Nos. 1912-1916, five 165' type PC submarine chasers for Bureau of Supplies & Accounts, U. S. Navy Dept., Washington, D. C.; 1675 gross tons.

Hull No. 1927, fabricated steel hull for oil barge. 165' x 35' x 10'; 502 gross tons.

Hulls Nos. 1928-1933, six welded steel deck barges for Delaware, Lackawanna & Western R. R., New York City. 100' x 30' x 9'6"; 1392 gross tons.

Hulls Nos. 1934-1945, twelve welded steel oil barges for stock; 195' x 35' x 9'9"; 7176 gross tons.

Hulls Nos. 1946-1955, ten W-7 welded steel coal barges for stock; 175' x 26' x 11'; 4720 gross tons.

Hull No. 1956, 25-ton floating crane for Charleston, S. C. Navy Dept., Washington, D. C.; 335 gross tons.

Hulls Nos. 1957-1966, ten type W-7 welded bulk cargo barges for stock. 175' x 26' x 11'; 4720 gross tons.

Hulls Nos. 1967-1972, six welded oil barges for stock. 195' x 35' x 9'9"; 3588 gross tons.

Hulls Nos. 1973-1976, four welded sand and gravel barges for Keystone Sand Div. 135' x 27' x 8'; 1020 gross tons.

Hulls Nos. 1977-1986, ten type W-7 welded bulk cargo barges for stock. 175' x 26' x 11'; 4720 gross tons.

Hulls Nos. 1987-1992, six welded oil barges for stock. 195' x 35' x 9'9"; 3588 gross tons.

Hulls Nos. 1993-2009, seventeen covered lighters for Bureau of Supplies and Accounts, Navy Dept. 8840 gross tons.

★ **Hulls Nos. 2010-2011, two welded side-dump scows** for Bureau S. & A., Navy Dept., Washington, D. C. 115' x 28' x 7'6"; 240 gross tons.

★ **Hulls Nos. 2012-2021, ten welded steel car floats,** for Pennsylvania R. R., Philadelphia, Pa. 250' x 34' x 9'1"; 5940 gross tons.

★ **Hulls Nos. 2022-2030, nine welded deck barges,** for Erie R. R. 100' x 30' x 9'6"; 2088 gross tons.

★ **Hull No. 2031, welded steel car float** for Erie R. R. 250' x 34' x 9'1"; 594 gross tons.

ELECTRIC BOAT COMPANY
Groton, Conn.

New Construction:

Two submarines, SS206, Grampus; SS208, Grayback; for U. S. Navy. Cost $2,937,000 each. Keels laid, Grampus, February 4, 1940; Grayback, April 3, 1940.

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One submarine, SS204, Mackeral, for U.S. Navy. Keel laid October 6, 1939. Launched September 28, 1940.

Three submarines, SS212, Gato; SS213, Greenling; SS214, Grouper; for U. S. Navy. Cost $2,957,000. Keels laid, Gato, October 5, 1940; Greenling, November 12, 1940.

Thirteen submarines, SS215, Growler; SS216, Grunion; SS217, Guardfish; SS218, Albacore; SS219, Amberjack; SS220, Barb; SS221, Blackfish; SS222, Bluefish; SS223, Bonefish; SS224, Cod; SS225, Cero; SS226, Corvina; SS227, Darter. Cost $2,795,000 each.

Twenty-five submarines, SS240-SS264.

THE FEDERAL SHIPBUILDING AND DRY DOCK COMPANY
Kearny, N. J.

New Construction:

Hulls Nos. 168-169, CL51, Atlanta; and CL52, Juneau; two 6000-ton cruisers for U. S. Navy. Keels laid April 22 and May 27, 1940.

Hulls Nos. 180-186, seven C-2 cargo ships for U. S. Maritime Commission. Keel laid, No. 180, April 17, 1941. Launching date, No. 179, May 29, 1941.

Hulls Nos. 190-193, four tankers for Sinclair Refining Co. 15,000 dwt. Keel laid, No. 190, November 12, 1940; No. 191, April 17, 1941. Launching date, No. 190, June 7, 1941. **Delivery date, No. 190, June 27, 1941.**

Hulls Nos. 194-197, four destroyers for U. S. Navy. Keels laid, Nos. 194-195, December 2, 1940; Nos. 196-197, December 16, 1940.

Hulls Nos. 198-203, six destroyers for U. S. Navy.

Hulls Nos. 204-205, two destroyers for U. S. Navy.

Hulls Nos. 206-213, eight destroyers for U. S. Navy.

Hulls Nos. 214-218, five destroyers for U. S. Navy.

Hulls Nos. 219-221, three cruisers for U. S. Navy.

Hulls Nos. 222-227, six destroyers for U. S. Navy.

Hull No. 228, one C-2 cargo ship for U. S. Maritime Commission. Keel laid, February 10, 1941. Launched July 11, 1941.

Hulls Nos. 229-230, two destroyers for U. S. Navy.

Hulls Nos. 231-232, two destroyers for U. S. Navy.

Hulls Nos. 233-240, eight cargo ships for the U. S. Maritime Commission.

Hulls Nos. 241-264, twenty-four C-2 cargo vessels for U. S. Maritime Commission.

GREAT LAKES ENGINEERING WORKS
River Rouge, Michigan

New Construction:

Hulls Nos. 287-289, three bulk freighters for Pittsburgh S. S. Co. 640′ x 67′ x 35′; 18,000 dwt; 4000-hp steam turbine engines.

HENRY C. GREBE & CO., INC.
Chicago, Illinois

New Construction:

One 70′ twin-screw diesel cruiser yacht.
Two 135′ mine sweepers for U. S. Navy.

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GREENPORT BASIN & CONSTRUCTION CO.
Greenport, L. I., N. Y.

New Construction:

Four coastal mine sweepers, AMC46-49, for U. S. Navy. **Delivered.**

Four coastal mine sweepers, AMC61-64, for U. S. Navy.

Twelve 135′ motor mine sweepers YMS 20-31, for U. S. Navy.

GULFPORT BOILER & WELDING WORKS, INC.
Port Arthur, Texas

New Construction:

Hull No. 176, diesel tug for General Motors Corp. 100′ x 24′ x 12′4″; 680 hp. **Delivery date, August 15, 1941.**

Hulls Nos. 185-187, three oil barges for Butcher-Arthur Corp., Houston, Texas. 165′ x 36′ x 10′9″. **Delivery dates, No. 185, August 1; No. 186, August 15; No. 187, August 30, 1941.**

Hull No. 189, diesel tug for General Motors Corp. 100′ x 24′ x 12′4″; 1000 hp. **Delivery date, September 5, 1941.**

★ **Hulls Nos. 190-194, five diesel-electric tugs,** for General Motors Corp., Cleveland Diesel Engine Division. 100′ x 24′ x 12′4″; 1000 shp.

GULF SHIPBUILDING CORP.
Chickasaw, Ala.

New Construction:

Four 2100-ton destroyers for U. S. Navy.

Four vessels for Waterman Steamship Corporation. 445′ x 63′ x 40′6″; shelter deck type; geared turbine drive; 15½ knots service speed.

★ **Six 220′ mine sweepers,** for U. S. Navy.

HOUSTON SHIPBUILDING CORP.
Houston, Texas

New Construction:

Hulls Nos. 1-37, thirty-seven EC-2 cargo vessels for U. S. Maritime Commission. Estimated delivery dates, first, January 15, 1942; last, February 24, 1943.

THE INGALLS SHIPBUILDING CO.
Pascagoula, Miss., and Decatur, Ala.

Pascagoula

New Construction:

Hulls Nos. 268, 297-299, four C-3-IN passenger-cargo vessels for U. S. Lines. Completion dates, May, November, December, 1942; and February, 1943.

Hulls Nos. 265-267, three C-3-P passenger-cargo vessels for American-South African Line, Inc. Completion dates, November, December, 1941; and January, 1942.

Hulls Nos. 293-296, four C-3-S-A-2 cargo vessels for U. S. Maritime Commission. Completion dates, February, March, May and June, 1942.

Hulls Nos. 325-336, twelve C3-S-A2 cargo vessels for the U. S. Maritime Commission. 492′ x 69′6″ x 42′6″. Keel layings, from April 30 to December 31, 1943.

Decatur

New Construction:

Hulls Nos. 313-314, two sand and gravel barges, for stock. 110′ x 26′ x 6′6″. **Delivery date, September 15, 1941.**

Hulls Nos. 318-319, two deck barges for West Virginia Pulp and Paper Co., N. Y. 105′ x 32′ x 7′. **Delivery date, August 31, 1941.**

Hulls Nos. 343-344, two 39,000-bbl oil

barges for Eddie Erlbacher, Cape Girardeau, Mo. 195′ x 35′ x 9′9″. Delivery date, December 10, 1941.

Hulls Nos. AN 1-4, four net layers for U. S. Navy.

Four 9,000-bbl oil barges for Standard Oil Company, Cleveland, Ohio. 195′ x 35′ x 9′9″. Delivery date, December 1, 1941.

★ **Hulls Nos. 345-348, four 1300-bbl. oil barges,** for Illinois Oil Company, Rock Island, Ill. 230′ x 40′ x 9′6″.

GEORGE LAWLEY & SON CORP.
Neponset, Mass.

New Construction:

Twelve 45′ tank lighters for U. S. Navy.

Two 127′ fish trawlers for Booth Fisheries Co. Diesel powered.

Five boats for repair work for U. S. Navy.

Ten 165′ submarine chasers for U. S. Navy.

Conversion:

★ **90′ launch Cutty Sark to U. S. Army launch Captain Dean C. Howard.**

LEVINGSTON SHIPBUILDING CO.
Orange, Texas

New Construction:

Hull No. 185, ocean tug for U. S. Navy; 135′ x 30′ x 17′6″.

Hulls Nos. 194-195, two tugs for stock. 66′ x 17′ x 8′; 300-hp Atlas diesel.

Hull No. 199, tug. 85′ x 23′ x 9′6″.

Hulls Nos. 200-201, two barges, for U. S. Navy. 173′ x 8′6″ x 39′.

Hulls No. 202, tug, for Pan American. 74′ x 20′ x 9′; 400-hp Atlas diesel.

Hull No. 203, 85′ coastwise tug for stock. 85′ x 24′ x 9′11″; 600-hp Atlas diesel.

Hulls Nos. 204-205; 207-210; six 8500-bbl oil barges for Pan American.

Hull No. 206, tug, for River Terminals. 74′ x 20′ x 9′; 400-hp Atlas diesel.

Hull No. 211, tug. 105′ x 25′ x 9′6″; 1000-hp General Motors diesel.

Hull No. 212, tug, for stock. 105′ x 25′ x 13′6″; 1000-hp General Motors diesel.

Hull No. 213, tug, for stock. 85′ x 23′ x 9′6″; 600-hp Superior diesel.

Hull No. 214, tug, for stock. 74′ x 20′ x 9′; 400-hp Atlas diesel.

THE LUDERS MARINE CONSTRUCTION CO.
Stamford, Connecticut

New Construction:

Seven 65′ Naval tugs, YT160-YT169. Cooper-Bessemer diesel engines.

Two submarine chasers, PC505-PC506, for U. S. Navy.

Nine small subchasers for U. S. Navy.

Six 65′ all-welded steel, single-screw distribution box boats for Quartermaster Corps, U. S. Army. Diesel propelled.

Three 165′ steel subchasers for U. S. Navy. Keel laid, first vessel, July, 1941.

Four wooden subchasers for U. S. Navy.

MANITOWOC SHIPBUILDING CORP.
Manitowoc, Wisconsin

New Construction:

Ten submarines, SS265-274, for U. S. Navy.

MARIETTA MANUFACTURING CO.
Point Pleasant, W. Va.

New Construction:

Hull No. 419, one steam stern-wheel towboat for Union Barge Line Corp., Pittsburgh, Pa. 167′ x 37′6″ x 8′2″.

Hulls Nos. 455-456, two all-welded steel bulk oil barges for stock. 195′ x 35′ x 10′.

Hull No. 457, all-welded steel fuel oil barge for Union Barge Line Corp., Pittsburgh, Pa. 135′ x 26′ x 9′.

Four net tenders, YN13-16, for the U. S. Defense Commission. Total cost $2,040,000.

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Logometers
Shaft Clearance Indicators
Electric Whistle Systems
Revolution Telegraphs

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McNAB OF BRIDGEPORT, INC.
Bridgeport, Conn.

Launching dates, March 20, April 17, June 19, July 2, 1941.

Hulls Nos. 474-485, twelve all-steam propelled mine planters, for the U. S. Army. Cost about $12,000,000. Keel laying dates, No. 474, May 14; No. 475, May 20; No. 476, June 24; No. 477, July 11, 1941.

MARINE IRON & SHIPBUILDING COMPANY
Duluth, Minnesota

New Construction:

Hulls Nos. 70-72, three 180′ cutters of "Cactus" type for U. S. Coast Guard.

JOHN H. MATHIS CO.
Camden, N. J.

New Construction:

Four anti-submarine net tenders for U. S. Navy.

One bulk carrier tanker 265′ long for Thos. Bowes, N. A.

Three 220′ mine sweepers for U. S. Navy.

MIAMI SHIPBUILDING CORP.
Miami, Florida

New Construction:

Two 54′ wooden hull motor torpedo boats for U. S. Navy, PT1-2. Cost $89,875. Keels laid, July 12, August 19, 1939. Launching dates, August 16, September 30, 1939.

Seven high-speed, off-shore patrol boats.

NEWPORT NEWS SHIPBUILDING & DRYDOCK CO.
Newport News, Va.

New Construction:

Hull No. 378, battleship 58, Indiana, for U. S. Navy. Keel laid November 20, 1939.

Hull No. 384, one single-screw combination passenger and cargo vessel for U. S. Maritime Commission. 465′ x 69′6″ x 42′6″; gross tonnage about 9100 tons. **Delivery date, September, 1941.**

Hull No. 385, aircraft carrier No. 8, Hornet, for U. S. Navy. Launched December 14, 1940.

Hull No. 386, single-screw combination passenger and cargo vessel for U. S. Maritime Commission. 465′ x 69′6″ x 42′6″; gross tonnage about 9100 tons. Delivery date, November, 1941.

Hull No. 389, one single-screw cargo vessel for International Freighting Corp., Inc. 435′ x 63′ x 40′6″; gross tonnage about 8000. **Delivery date, August 1, 1941.**

Hulls Nos. 390-391 (CL62-CL63), two light cruisers for U. S. Navy.

Hulls Nos. 392-394 (CV9-CV11), three aircraft carriers for U. S. Navy.

Hulls Nos. 395-398 (CV12-CV15), four aircraft carriers for U. S. Navy.

Hulls Nos. 399-400 (CL80-CL81), two light cruisers for U. S. Navy.

THE NEW YORK SHIPBUILDING CORPORATION
Camden, N. J.

New Construction:

BB57, South Dakota, battleship for U. S. Navy. Keel laid July 5, 1939.

AR5, Vulcan, repair ship for U. S. Navy. Keel laid December 26, 1939.

CL55, Cleveland; and CL56, Columbia; two cruisers for U. S. Navy. Order placed March 23, 1940.

CL57 and CL58, two cruisers for U. S. Navy. Order placed June 12, 1940.

AV7, Currituck. seaplane tender for U. S. Navy.

CL59-CL61, three cruisers for U. S. Navy.

CB1-CB6, six cruisers for U. S. Navy.

CL76, four cruisers for U. S. Navy.

NORTH CAROLINA SHIPBUILDING CO.
Wilmington, N. C.

New Construction:

Thirty-seven all-welded steel EC-2 cargo ships for U. S. Maritime Commission.

THE PUSEY & JONES CORP.
Wilmington, Del.

New Construction:

Hulls Nos. 1075, Marina; 1076, two C-1A cargo ships. Launching date, No. 1076, August, 1941. Delivery dates, No. 1075, August, 1941; No. 1076, November, 1941.

Hulls Nos. 1082, Hains; and 1083, Hoffman; two seagoing hopper dredges for War Dept., U. S. Engineers Office, Philadelphia, Pa. 215′10½″ x 40′ x 15′6″; approx. 2000 gross tonnage; diesel-electric propulsion, 950 shp. Delivery dates, February and August, 1942.

Hulls Nos. 1084-1093, ten C-1A type cargo ships for U. S. Maritime Commission. 412′3″ x 60′ x 37′6″; 9000 dwt; 4000-hp steam turbine propulsion.

R. T. C. SHIPBUILDING CORP.
Camden, N. J.

New Construction:

Hull No. 136, 1700-ton motor tanker, T. W. Drennan. 260′ x 42′ x 18′ Launching date, July 19, 1941.

Hull No. 137, 995-ton motor tanker. 190′ x 36′ x 12′.

Hulls Nos. 138-139, two 985-ton motor tankers. 190′ x 36′ x 12′.

SUN SHIPBUILDING AND DRY DOCK COMPANY
Chester, Pa.

New Construction:

Hulls No. 186, Rio Hudson; No. 187, Rio Parana; No. 188, Rio de la Plata; No. 189, Rio de Janeiro; four C-3 cargo and passenger liners for U. S. Navy Department. 492′ x 69′6″ x 42′6″; 8500 gross tons; diesel propelled; 8500 shp; 16½ knots. **Delivery dates, No. 186, July 31; No. 187, September 2; No. 188, September 30;** No. 189, October 30, 1941.

Hulls Nos. 199-206, eight C-2 cargo vessels for U. S. Maritime Commission. 474′ x 63′ x 40′6″; 7400 gross tons; diesel propelled; 7500 shp; 16 knots. **Launching dates,** No. 199, May 24; No. 200, June 21; No. 201, July 26; **No. 202, August 23; No. 203, September 20;** No. 204, October 18; No. 205, December 6, 1941; No. 206, January 14, 1942. **Delivery dates, No. 199, September 25;** No. 200, October 15; No. 201, October 30; No. 202, December 1; No. 203, December 15; No. 204, December 31, 1941; No. 205, February 10; No. 206, March 15, 1942.

Hull No. 210, tanker, for Petroleum Shipping Co. 520′ x 68′ x 37′; 10,400 gross tons; turbine; 4000 shp; 13 knots. Launching date, June 9, 1941. **Delivery date, August, 1941.**

Hulls Nos. 213-216; 219-220, six tankers for Panama Transport Co. 547′3″ x 70′ x 40′; 11,400 gross tons; 7500 shp; 15 knots speed. Launching and delivery dates, 1942-1943.

Hulls Nos. 217-218, two tankers for Standard Oil Co. of N. J. 547′3″ x 70 x 40′; 11,400 gross tons; 7500 shp; 15 knots speed. **Launching dates, No. 217, August 2; No. 218, September, 1941.** Delivery dates, No. 217, October; No. 218, November, 1941.

Hulls Nos. 221-222, two tankers for Keystone Tankship Corp. 520′ x 68′ x 37′; 10,600 gross tons; turbine; 12,000 shp; 16½ knots. **Keel laying dates,** No. 221, June 12; No. 222, **September 11, 1941.** Launching dates, No. 221, October 4, 1941; No. 222, January 10, 1942. Delivery dates, No. 221, December, 1941; No. 222, March, 1942.

Hulls Nos. 223-225, three tankers for The Texas Co. 513′10″ x 68′ x 36′; 9300 gross tons; turbine; 9000 shp; 16 knots. Launching and delivery dates, 1942.

Hull No. 226, tanker for Kaymar Tankship Corp. 520′ x 68′ x 37′; 10,600 gross tons; turbine; 12,000 shp; 16½ knots. Keel laying date, December, 1941.

Hulls Nos. 227-228, two tankers for Seamar Tankship Corp. 520′ x 68′ x 37′; 10,600 gross tons; turbine; 12,000 shp; 16½ knots. Keel laying dates, 1942.

Hull No. 229, tanker for Atlantic Refining Co. 543′10″ x 70′ x 40′; 11,600 gross tons; turbo-electric; 5000 shp; 13 knots. **Launching date, August 2, 1941. Delivery date, August 16, 1941.**

Hull No. 230, tanker for Atlantic Refining Co. 474′ x 65′ x 37′; 8000 gross tons; turbo-electric; 5000 shp; 14½ knots. **Launching date, September 19, 1941.** Delivery date, 1942.

Hulls Nos. 231-232, two tankers for Keystone Tankship Corp. 520′ x 68′ x 37′; 10,600 gross tons; turbine; 12,000 shp; 16½ knots. Delivery date, 1942.

Hulls Nos. 233 and 240, two tankers for Gulf Oil Corp. 485′ x 68′ x 36′; turbine propelled; 14½ knots. Delivery dates, August, 1942, and December, 1942.

Hull No. 234, tanker for Sun Oil Co. 547′3″ x 70′ x 40′; 11,400 gross tons; diesel propelled; 7500 shp; 15 knots. Delivery date, 1942.

Hulls Nos. 235 and 237, two tankers for Standard Oil Co. of N. J. 547′3″ x 70′ x 40′; 11,400 gross tons; turbine; 7500 shp; 15 knots. Delivery date, 1942.

Hull No. 236, tanker for Atlantic Refining Co. 543′10″ x 70′ x 40′; 11,600 gross tons; turbo-electric; 5000 shp; 13 knots. Delivery date, 1942.

(Page 114, please)

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Keep Posted

(Continued from page 77)

The following paragraph is quoted from a report of tests conducted by a tank ship operator:

"In the case of a tanker application by an East Coast operator, steel plates coated with Resistal M-600 have been in the tanks of a ship since July, 1940. During that time, the ship carried 26 cargoes of gasoline and four of casinghead gasoline. On all of the voyages, the ship returned to home port in ballast and the tanks were steamed three times for gas-freeing during this period. The material stood up remarkably well. The film of Resistal M-600 did not appear to have been reduced in thickness and it did not dry out, but remained slightly rubbery or gummy when indented with the finger nail, while in no way soft. A plate, taken from the bottom of the tank, which came in contact with brine, showed very considerable corrosion on the unprotected section."

* * *

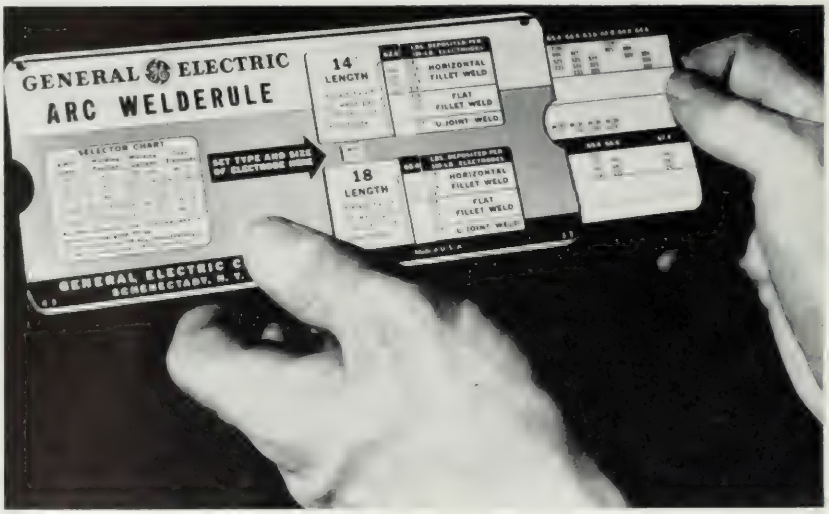
Use More Preheat For Bevel-Cutting

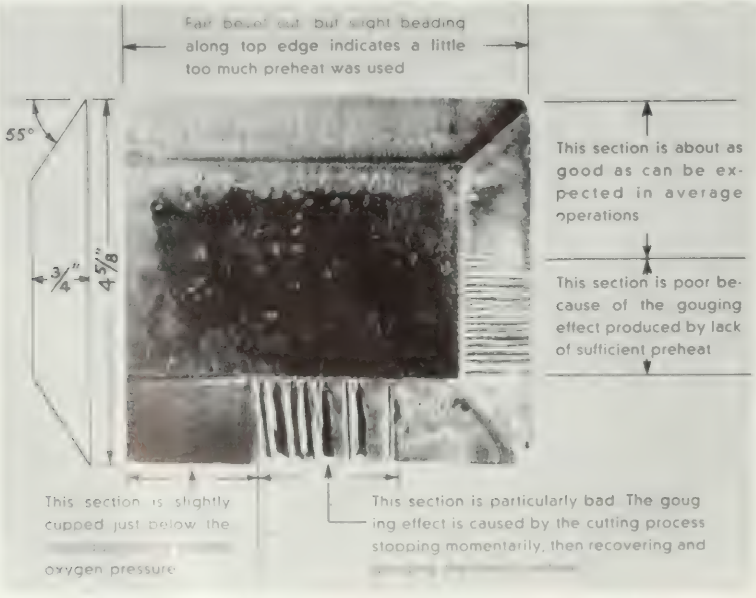
The accompanying photograph indicates better than words can describe what happens when insufficient preheat is used for bevel-cutting steel plate with oxy-acetylene cutting machines.

The reason that more preheat is required for bevel-cutting than for vertical cutting operations is that the blowpipe is at an angle to the plate surface. Because of this, the heat tends to "bounce off" and does not penetrate to the same extent as when the preheat flames strike the plate at right angles. Obviously, the flatter the angle of cut, the greater amount of preheat required.

There are a number of ways to obtain more heat. For normal beveling up to angles of 45°, sufficient preheat can be obtained with standard nozzles by slightly "forcing" the preheat flames as the angle of bevel increases. For very shallow angles it is sometimes necessary to provide supplementary preheat, either with a second blowpipe, or else by first going over the line of cut with the cutting blowpipe, A size larger nozzle or slightly slower cutting speeds also are of help sometimes. Because of the high temperature of the oxy-acetylene flame, acetylene offers special advantages for beveling where preheat requirements are greater than for normal severing.

When selecting the correct size nozzle to use, the depth of the actual cut should be considered rather than the thickness of the plate.




Fair bevel cut but slight beading along top edge indicates a little too much preheat was used
55°
3/4"
4 5/8"
This section is about as good as can be expected in average operations
This section is poor because of the gouging effect produced by lack of sufficient preheat
This section is slightly cupped just below the [illegible] oxygen pressure
This section is particularly bad The gouging effect is caused by the cutting process stopping momentarily, then recovering and [illegible]

An interesting photograph illustrating common faults in flame-cut bevels

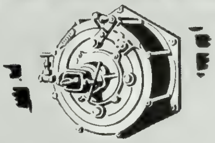
A New Time-Saver For Arc Welding

Engineers, supervisors, purchasing agents, operators and all others who use or supervise the use of arc welding electrodes will want a copy of the new General Electric Arc Weldrule because of the time it saves in estimating electrode requirements. Operating in a manner similar to a slide rule, the Arc Weldrule reads directly the length of arc welded joints obtainable per 100 lbs. of electrode; also the pounds of weld metal deposited per 100 lbs. of electrode. The information covers 11 different commonly used sizes and types of joints; also 22 different sizes and types of popular electrodes in both the 14- and 18-inch lengths.

Although general data of a similar

(Page 110, please)

TODD
COMBUSTION EQUIPMENT

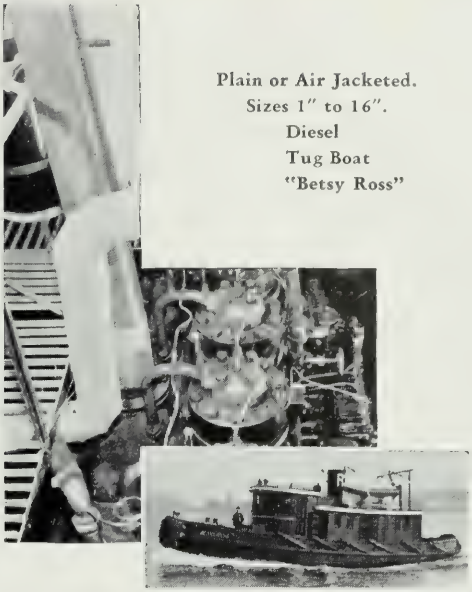


Installations individually engineered to a high point of efficiency and dependability in the firing of marine boilers by liquid fuel . . . industrial and commercial boilers by liquid or gaseous fuel. Consultation invited.

TODD COMBUSTION EQUIPMENT, INC.
(Division of Todd Shipyards Corporation)
601 West 26th Street, New York City

TODD

Mobile New Orleans Galveston Seattle London Buenos Aires

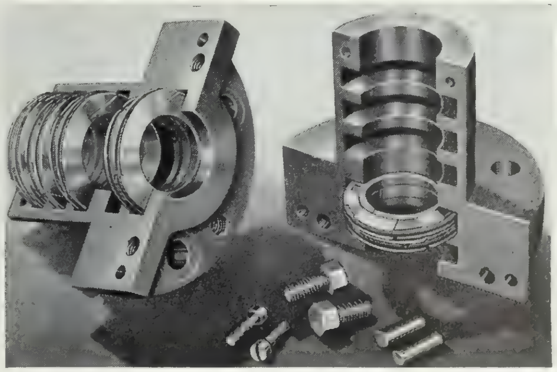


Plain or Air Jacketed.
Sizes 1" to 16".
Diesel
Tug Boat
"Betsy Ross"

VIBRATION, long-sustained in tow service, would put a terrific strain on the "Betsy Ross" exhaust manifold were it not for the use of PENFLEX. This is the flexible pipe with 3/8" of "come and go" for every foot of length. Four-wall interlocking joint construction, bends to fit on the job without use of heat or special tools. Send for Bul. 70.

Western Representation by
U. S. Flexible Metallic Tubing Co.
Los Angeles · San Francisco · Portland · Seattle

Pennsylvania Flexible Metallic Tubing Co.
7228 Powers Lane Philadelphia, Pa.



Specify FRANCE Metal Packing for Marine Engine Piston and Valve Rods

Nearly half a century of experience guarantees *maximum performance* at *minimum expense* for high, intermediate and low pressure service.

To obtain renewals or replacements, furnish the number stamped on case and diameter of rod. Write for new Catalog M-6.

Sole Authorized Representatives:

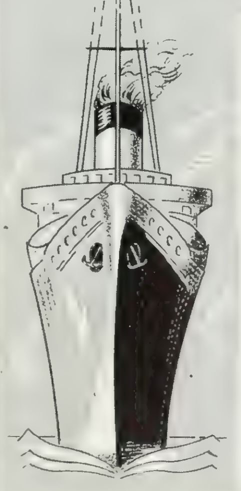
San Francisco — Hercules Equipment & Rubber Co., 550-3rd Street—EXbrook 2575.
Seattle—Guy M. Thompson, 1241 South Alaskan Way — Phone MAin 1870.
Norfolk—C. E. Thurston & Sons, 56 Commercial Place — Phone Norfolk 2-6040.
Los Angeles — A. C. Elder, 2714 South Hill St.—PRospect 9529.
New York City—France Packing Co., Room 107-E, 30 Church St. —COrtlandt 7-6827.
New Orleans—R. M. Shad, 430 Florida Ave.—Phone Galvez 1503.

THE FRANCE PACKING COMPANY
Tacony, Phila., Penna.

Original FRANCE METAL PACKING

MADE IN U. S. A.

DEX-O-TEX
RUBBER LATEX DECKING
THE MODERN DECK AND BULKHEAD SURFACING MATERIAL



RESILIENT
NON SLIP
DECORATIVE
LIGHT WEIGHT
PERFECT ADHESION
NON-CORROSIVE
INHIBITS CORROSION

●

Pacific Coast Licensed Applicators

MALOTT & PETERSON
20th & Harrison Sts.
San Francisco, Calif.

RAECOLITH FLOORING CO.
5622 Corson Avenue
Seattle, Washington

CROSSFIELD PRODUCTS CORP.
BROOKLYN, N. Y.
191 CENTRE ST.
TEL. TRIANGLE 5-5268

LOS ANGELES, CALIF.
2153 SACRAMENTO ST.
TEL. VANDIKE 2669

nature have been published in bulletin form, the new Arc Weldrule enables more accurate estimates to be made because it applies to specific types and sizes of electrodes. Being of vest pocket size, it is also handier, easier, and more convenient to use in getting the answer quickly.

An additional feature of the Arc Weldrule is a selector chart which shows the various filler metal classifications as specified by the American Welding Society and the types of electrodes which meet these specifications. This new Arc Weldrule may be obtained from your local G-E Arc welding distributor.

Safe-Line Clamp In Bomb Loading

Handling of the most dangerous piece of mechanism in the Air Service today is accomplished safely by the Safe-Line wire rope clamp.

The illustration shows this new application in the form of lifting a high explosive bomb into a bomber plane by a new type of bomb-hoist truck manufactured by one of the largest Detroit automobile companies.

The manufacturers claim that the clamp was insisted upon by the directing officials because of its phenominal uniform dependability. They also claim this same dependability should be of intense interest to industrialists and worthy of complete investigation.

The Safe-Line wire rope clamp is manufactured by the National Production Company of Detroit.

◆

Constructive Propaganda

Republic Steel Corporation's current series of four-color ads in Saturday Evening Post is winning much favorable comment from both civilian and military sources, it is reported by Chester W. Ruth, Republic's director of advertising.

The first Scotch marine boiler loaded for shipment from Western Pipe & Steel Company's Los Angeles plant to the Todd-California Shipbuilding Corp., Richmond, California, for British ships

The series, prepared by Meldrum and Fewsmith, Cleveland, highlights the necessity for speed in the National Defense effort, asserts that steel is America's first line of National Defense, and emphasizes that the men who make steel are setting new records in its production.

Republic Steel, the ads point out, is producing many kinds of steel for a wide range of defense requirements.

Copy in the series is dramatic. It differs sharply from other current examples of the use of the National Defense theme in advertising. It subordinates Republic's own story to a nationwide appeal for an all-out defense effort.

The ads point out one fact which has been rather generally overlooked in the rush to help instill in the American mind the great importance of National Defense: that defense implements consist of far more than just guns, airplanes, tanks, armored cars, battleships and the many other products designed for actual combat equipment.

The ads note that agriculture, transportation, building construction, food, oil and other leading industries likewise are of vital importance to the program, and that these must not be slighted or forgotten in the appraisal of our program to strengthen our defensive position.

The series features illustrations by Peter Helck, Anton Otto Fischer, and other well-known artists. The illustrations are built around the various implements—both of war and of peace—in which steel is the predominant material.

◆

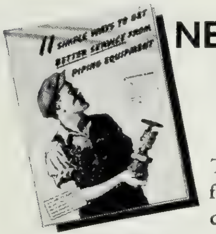
Lucite On Board Ship

Bases for lamps, arms of chairs and a clock face are among the utilitarian and decorative fixtures of Lucite methyl methacrylate plastic on the new S. S. Robin Sherwood, which sailed in July from Brooklyn, New York, on its maiden voyage to South Africa and East Africa.

"Its crystal clarity, lightness, beauty, durability and virtual indestructability make Lucite particularly attractive for marine architecture," says George G. Sharp, designer of the combination passenger - freight vessel. The Robin Sherwood is the fourth of six sister ships to ply Atlantic waters.

The edge-lighted face of a buffet clock is the most striking application of Lucite. Numerals are inscribed on the Lucite face, and light is "piped" to them from a source behind the clock case. The face gives off no glare or heat, for Lucite has the striking property of "piping cold light around curves."

Arms of Lucite add new beauty to the dining saloon chairs, and veranda and stateroom lamps have modern, original bases of Lucite. This crystal-clear plastic also is used elsewhere for decorative purposes.



NEW CRANE BULLETINS HELP YOU AVOID PIPING TROUBLE

These new illustrated shop bulletins for your pipe fitters and maintenance crews help them install piping properly and keep it working right. Also, help you train new men to do a better job. Ask your Crane Representative for this timely service—or, write direct. It's free!

CRANE VALVES · FITTINGS · PIPE PLUMBING · HEATING · PUMPS

CRANE CO., GENERAL OFFICES: 836 S. MICHIGAN AVE., CHICAGO

NATION-WIDE SERVICE THROUGH BRANCHES AND WHOLESALERS IN ALL MARKETS

The Isherwood Systems of Ship Construction

There is an Isherwood System for every type of mercantile vessel . . . .

Eminently suitable for Oil Tankers . . . . .

Over 500,000 deadweight tons—Freighters and Tankers—on order . . . .

SIR JOSEPH W. ISHERWOOD & CO.
LIMITED

4 Lloyds Ave., London E.C.3 17 Battery Place, New York

CORDES BROS.

200 DAVIS STREET SAN FRANCISCO

San Francisco Bar Pilots
"Adventuress" · "California" · "Gracie S"
RADIO — K F S

SIGNALS FOR PILOTS

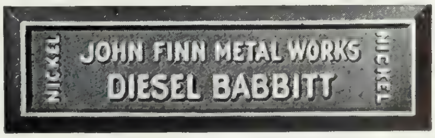
In Fog—Blow four whistles and lay to.
When Clear—Burn blue light or give four flashes on Morse lamp.
Daylight—Set Jack at foremast.

SIGNALS DISPLAYED BY PILOT BOATS

When on Station Under Sail—A white light is carried at masthead.
When Under Power—A red light under white; a flare or torch is also burned frequently.

TELEPHONES—Pilot Office from 9:00 a.m. to 4:00 p.m.—DOuglas 5436. Chamber of Commerce from 4:00 p.m. to 9 a.m. and on Sundays and Holidays—EXbrook 4511.

John Finn Metal Works



SPECIAL ARMATURE METAL
NICKEL DIESEL METAL FOR BEARINGS
ZINC PLATES FOR BOILERS
GALVANIZING

SAN FRANCISCO—384 Second Street—Phone SUtter 4188
LOS ANGELES BRANCH—554 South San Pedro Street, Los Angeles
Telephone MIchigan 0984

Morrison & Bevilockway
ESTABLISHED IN 1890

MARINE PLUMBING
STEAM FITTING *and* SHEET METAL WORK

Sole Agents and Manufacturers of the New M & B Automatic Lifeboat Drain Plug · Expert Lifeboat Repairs and all kinds of Air Duct Work · Galley Ranges Repaired · Monel and Stainless Steel Dressers Manufactured

Day & Night Service 166 Fremont St.
Telephone DO-2708-09 San Francisco

At Night Call HEmlock 4346 or Burlingame 129

Propeller Design

- Save Fuel
- Increase Speed
- Eliminate Vibration

Send us your problems . . . we specialize in propeller design.

WILLIAM LAMBIE, Naval Architect
106 East C Street Wilmington, California

LAMBIE PROPELLERS

HAVISIDE COMPANY

Largest Commercial Heavy-Lifting and Salvage Barges on the Pacific Coast

Four Derrick Barges . . . . Capacity up to 100 tons
Submarine Diving

SHIP CHANDLERS

Specialists: Yacht Sails and Yacht Rigging
Complete stock of Yacht and Motorboat Supplies

Agents for
Columbia Steel Co.'s Products (Subsidiary U. S. Steel Corporation)
American Marine Paint Co. Jeffrey's Marine Glues
Tubbs Supercore and Manila Rope Stratford's Best Oakum

HAVISIDE COMPANY
SAN FRANCISCO
56-62 Steuart Street - Phone EXbrook 0064

HOT off the PRESS

The Catalogs of Today Become the Technical Handbooks of Tomorrow

New Encyclopedia of Machine Shop Practice, a 576-page volume; published early in August by Wm. H. Wise & Co., New York; about 1,000 illustrations and many tables; price $1.98 net.

This book is designed for popular use in schools, vocational courses, factory reference libraries, and especially for home study.

Though encyclopedic in content and copiously indexed for ready reference—with 2800 items listed—the text is written in clear and concise descriptive form. Its language is plain, understandable by the layman, avoids deep technicalities and difficult mathematics. Besides being a good reference book, it is suitable for consecutive reading, and so read gives a good, rapid grasp of the whole field.

International Communication Rates. Due to the war there have been certain important changes in the routings and rates for international communications. The Mackay Radio and Telegraph Company has compiled and released current rate information in a folder, designed to be helpful at this time particularly to persons responsible for business communications. The rates are included for points in Europe, Latin America, the Orient, Hawaii and the Philippine Islands, ships at sea, and also the lower per word radiotelegraph rates prevailing between New York, Chicago, Washington, Boston, Philadelphia, Camden, Baltimore, Detroit, New Orleans, San Francisco, Los Angeles, Oakland, San Diego, Long Beach, California; Portland, Oregon; Seattle and Tacoma.

Marine Insulation by Mundet

● LOW TEMPERATURE . . .

It pays to have the protection of Mundet "Jointite" Corkboard and Moulded Cork Pipe Covering in storage terminals and refrigerated spaces aboard ship. This low temperature insulation gives dependable protection against heat infiltration. Economical, long-lasting, it is easily adaptable to individual requirements. Our engineering staff will be glad to help with specifications.

● HIGH TEMPERATURE . . .

We carry a full line of K & M asbestos and magnesia insulating products for marine requirements. K & M insulation, made by Keasbey & Mattison, assures highest efficiency and maximum power savings in high temperature operation. For full information on either low or high temperature insulation, write to the nearest Mundet office.

MUNDET CORK
CORPORATION

SAN FRANCISCO . . . . 440 Brannan Street
LOS ANGELES . . . . 1850 N. Main Street

Distributors of Mundet Cork Insulation Products

SEATTLE . . . . Pioneer Sand & Gravel Co.
PORTLAND . . . . Pacific Asbestos & Supply Co.

FITLER LUBRICORE

THE SELF-LUBRICATING PURE MANILA ROPE

CONTROLLED SELF-LUBRICATING GREEN YARN CENTER

IDENTIFIED BY THE BLUE AND YELLOW COLORED YARN TRADEMARK

U. S. PATENT NO 2,176,422

SOLD BY DEALERS EVERYWHERE

FITLER TRADE MARK ESTABLISHED 1804

It is common sense that where there are many fibres chaffing against each other friction will be generated unless a proper lubricant is applied at the right spot.

The right spot in a rope is the center yarns—it is at this point where Fitler Patented feature of lubrication permits the center yarns to glide easily upon each other. This exclusive feature with Fitler Lubricore Rope means much in reducing water absorption, thus allowing center yarns to dry out more quickly.

BE THRIFTY—Insist on the Fitler Brand. Easily identified by the Blue & Yellow Trademark.

WEST COAST AGENTS:

Fletcher-Weil Co.
Los Angeles, Calif.
San Francisco, Calif.

•

Coleman & Co.
Portland, Oregon

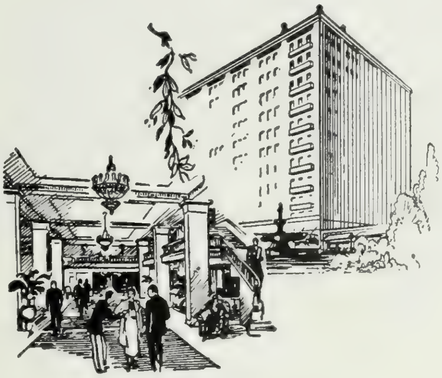
TOUMEY ELECTRIC & ENGINEERING CO.

Representing
BENDIX MARINE PRODUCTS CO.
Successors to
CHAS. CORY CORPORATION
Signaling, Communicating and Lighting Equipment
PNEUMERCATOR CORPORATION (New York)
Gauges: Liquid Level, Ships Draft, Pressure, Boiler Water Level
PLANT MILLS DIRECTION INDICATOR AND ENGINEER'S ALARM

MARINE AND INDUSTRIAL ELECTRIC INSTALLATIONS . . MARINE ELECTRIC FIXTURES . . SUPPLIES AND REPAIRS . . . ARMATURE WINDING . . SEARCHLIGHT PROJECTORS . . . SOUND POWERED TELEPHONES . . . FIRE ALARM SYSTEMS

GArfield 8102 SAN FRANCISCO 115-117 Steuart St.

Inexpensive COMFORT



HOTEL CLARK

In the "Center of Things"

In DOWNTOWN **LOS ANGELES**

—directly opposite the
SUBWAY TERMINAL
Fifth and Hill

EVERY facility and appointment of the Clark has been planned to afford its guests a maximum of comfort and convenience. Large enough to house a thousand people, yet small enough to permit personal service and friendliness to be truly emphasized.

- 5 minutes from the Union R. R. Terminal.
- 15 minutes from "HOLLYWOOD" — land of the movies and radio.

555 rooms with baths *from* $2.50

Personal management of P. G. B. Morriss

In tube cleaners as in everything else, nothing takes the place of experience.

ELLIOTT COMPANY
LAGONDA TUBE CLEANER DEPT.
LIBERTY TUBE CLEANER DEPT.

Factory Sales and Service Maintained
813 RIALTO BLDG., SAN FRANCISCO
Phone SUtter 5213
Los Angeles, 1732 E. 7th St. Seattle, Wn., 414 Vance Bldg.

Contributing to your overhead economies!

PLYMOUTH ROPE . . . offers longer life and greater dependability in hard service because of its unsurpassable QUALITY

PLYMOUTH 1824

PLYMOUTH CORDAGE COMPANY
NORTH PLYMOUTH · MASS

WANTED: Combination Naval Architect and Marine Engineer for research exclusively.

Prefer man now employed. Must be thoroughly educated, experienced in design and progressive in ideas. Give references, experience and salary in first letter. Large established shipbuilding company.

Address Box 818, PACIFIC MARINE REVIEW, 500 Sansome St., San Francisco.

Dependable Power. Turbine-generators, 200 kw and above, for marine service are described in a new 4-page folder, F-8571, announced by Westinghouse Electric and Manufacturing Company.

The general discussion includes such features as space conservation, accessibility of parts, and directed air flow. A cutaway photograph shows positions of the principal parts.

The strap type, oil-relay governor, an exclusive feature of this turbine, is described and illustrated.

Application data give kw rating, physical dimensions, weight and other essential facts.

◆

The Fast, Modern Way to Drill, Circular No. JE-112, a new bulletin showing the latest U14 type ¼″ capacity, small, light, one-hand electric drills, has just been issued by the Independent Pneumatic Tool Co., Chicago, Illinois. Containing six pages of information and specifications on Thor ¼″ portable electric drills for every industrial application, this circular presents the complete range of models, motor sizes, speeds and switch styles.

◆

Flow Meters by Cochrane, a 52-page handbook of instrument application to steam, water, air, gas and viscous, volatile and corrosive fluid measurement, published by the Cochrane Corporation as Publ. No. 3010. Considerable space is devoted to the importance of flow records in the efficient operation of boiler and turbine rooms and various process departments.

Thorough description of important operating details is given on ten different types of instruments, including the new Linameter for difficult-to-measure fluids, the ring-balance meter for low-pressure gases, electrical and mechanical weir meters, and liquid level instruments. The construction features of the friction-free electric flow meter and the high-torque mechanical flow meter are explained in great detail with full-size illustrations of these instruments showing the high readability of the 12-inch chart record, indicating scale, and totalizing integrator.

Special sections are devoted to control applications, dual range recorders, detached instruments, and summation meters. A list of available charts, with tabulated descriptions of each, is included as a guide to Cochrane meter users.

◆

Constant Potential DC Welding System, Catalog Section 26-200, a new eight-page booklet announced by Westinghouse Electric and Manufacturing Company.

Motor-generators with ratings from 750 to 1500 amperes to meet welding system requirements are discussed with a note on parallel operation. Mechanical parts, controls and motor starting equipment are described. A typical wiring diagram shows electrical arrangement of principal parts in the system.

Distinctive features and prices are listed for the stationary and semi-portable units and accessories.

Progress in American Shipyards

(Continued from page 106)

Hulls Nos. 238-239, two tankers for Standard Oil Co. of Calif. 521′ x 70′ x 40′; turbine propelled; 15½ knots. Delivery dates, November and December, 1942.

Hulls Nos. 241-312, seventy-two tankers.

SOUTH PORTLAND SHIPBUILDING CORP.

Portland, Maine

New Construction:

Hulls Nos. 201-216, sixteen EC-2 type cargo vessels, for U. S. Maritime Commission.

TAMPA SHIPBUILDING CO.

Tampa, Fla.

New Construction:

Hulls Nos. 37-40, four C-2 type cargo vessels for U. S. Maritime Commission. 459′ x 63′ x 31′6″; 9291 dwt tons.

TODD-BATH SHIPBUILDING CORP.

Bath, Maine

New Construction:

Thirty cargo vessels for British Purchasing Commission. Cost $50,000,000.

F. B. WALKER & SONS

Pascagoula, Mississippi

New Construction:

One all-welded steel tug for Florida interests. 68′ x 17′ x 8′6″; 300-hp Atlas diesel.

One all-welded steel tug for Colle Towing Co. 75′ x 19′ x 9′; 400-hp Atlas diesel.

One all-welded steel barge, 132′x32′x8′6″.

Two all-welded steel oil barges, 180′x36′ x 9′.

Two steel tugs, 75′ x 19′ x 8′6″.

WHEELER SHIPYARDS, INC.

Brooklyn, N. Y.

New Construction:

Ten bomb target boats for U. S. Navy.

Forty 83′ cutters for U. S. Coast Guard. Cost $42,500 each.

Twelve large wooden mine sweepers for U. S. Navy.

SAVE and PLAY SAFE

There are Exides for every type and size of vessel . . . all built for absolutely dependable service under every condition afloat. Combined with the long, low-cost service they give, and their reasonable prices, this makes Exide a money-saving investment . . . aboard the smallest vessel or the largest.

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia
The World's Largest Manufacturers of Storage Batteries for Every Purpose
Exide Batteries of Canada, Limited, Toronto

LOS ANGELES, CALIF.
1043 S. Grand Ave.

SEATTLE, WASH.
1919-20 Smith Tower Bldg.

SAN FRANCISCO, CALIF.
6150 Third Street

Exide
IRONCLAD
MARINE BATTERIES

Pacific MARINE REVIEW

San Francisco Bay! *October, 1941*

Scene of LAUNCHINGS · SHIPS · MIGHTY STRUCTURES—and HARBOR FOR THE PROPELLER CLUB NATIONAL CONVENTION AND AMERICAN MERCHANT MARINE CONFERENCE OF 1941

MINING INDUSTRY

Well to the front of Western industries today proving of vital value to America's defense is mining. From Alaska to our Southern borders . . . from the Sierras to the peaks of the Rockies, Western mining is contributing an important share to keep America's borders safe.

Both Tubbs and Portland Cordage Companies are proud that most of the famous names identified in mining in the West are also large users of Tubbs and Portland rope. We are glad that our products may do their share in aiding America's defense.

In the Marine field, too, you will find both the Tubbs and Portland rope trademarks on the job, aiding through dependable service the building and maintenance of America's rapidly growing Merchant Marine.

TUBBS CORDAGE CO. • SAN FRANC

PORTLAND CORDAGE CO. • SEATTLE - PORT

Pacific MARINE REVIEW

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Official Organ

Pacific American Steamship Association

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Shipowners Association of the Pacific Coast

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President and Publisher

B. N. DeRochie
Assistant Publisher

Alexander J. Dickie
Editor

Paul Faulkner
Advertising Manager

Daniel L. Pratt
Northwest Representative

THE OIL *used to lubricate and cool the turbines of the new*
S.S. PRESIDENT HAYES
is safely used over and over again.

A SHARPLES EN BLOC OIL PURIFIER

removes impurities . . . such as dirt, grit, carbon, sludge and water . . . from the oil.

The Sharples En Bloc Oil Purifier is a complete plant in one unit . . . a Sharples Vaportite Super-Centrifuge . . . two direct driven gear pumps, one for intake of dirty oil, the other for discharge of purified oil . . . electrical heaters optional.

MASTER ELECTRIC CONTROL . . . . . one push button controls the Super-Centrifuge motor, pumps and heater . . . . . adequate overload protection.

Bulletin No. 1216-B gives complete details as to sizes, weights, effective capacities of the five standard models.

THE SHARPLES CORPORATION

SHARPLES

Representatives throughout the world

★ CENTRIFUGAL AND PROCESS ENGINEERS ★
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LONDON PARIS TOKIO
NEW YORK BOSTON PITTSBURGH CLEVELAND DETROIT
CHICAGO DALLAS SEATTLE SAN FRANCISCO LOS ANGELES

Dedicated to America's Merchant Marine

and the Fifteenth Annual Convention of the Propeller Club of the United States with which is convening the American Merchant Marine Conference, in San Francisco, October 21st to 24th, 1941

PACIFIC
MARINE REVIEW
October, 1941

Will America

Rear Admiral
EMORY S. LAND
Chairman United States
Maritime Commission.

"At a time when the sea lanes of the Pacific grow in importance, it is most appropriate that the great seaport of San Francisco has been selected as the scene of the 1941 American Merchant Marine Conference."

"America must build 4,000,000 to 5,000,000 tons of ships a year. . . ."

Captain
HOWARD L. VICKERY
United States
Maritime Commissioner.

Flag Shipping accept the Challenge?

By CHARLES L. WHEELER

Executive Vice President
McCormick Steamship Co.

San Francisco's Propeller president CHARLES L. WHEELER, *addressing members and guests aboard the California Maritime Academy training ship.*

THE building of a modern American Merchant Marine and a two-ocean navy which the shipping industry and naval men have dreamed since the middle 1920's has become a reality achieved through an international emergency which threatens the United States. Only too-well-known is that pressure of an emergency arises before indifference, lethargy, lack of information and often selfish or misguided influences can be overcome.

The unexpected and advanced achievement of this goal because of the current international situation has resulted in a challenge—how to handle the aftermath or the hangover? How to handle successfully the readjustments from abnormality to a new and more stable condition, and how to pursue positively and develop progressively the opportunities that arise from the change?

This so-called emergency or aftermath is a problem of our domestic economy in general—employment, industry, social problems, finance and so on. Transportation readjustments are one division of the whole, and ocean transportation is one section of that division.

In the case of shipping, the present shipbuilding program has far surpassed the original blueprint of what was necessary to create an adequate merchant marine. Normal trade routes are badly disrupted. Some companies are greatly expanded and others have sacrificed personnel and ships and facilities.

However, contrary to the usual procedure of waiting until the last minute the ocean transportation section of this economy is to be subjected during October to a searching analysis of how the shipping industry is going to face the aftermath of the current international emergency.

ARTHUR M. TODE

Honorary President of
The Propeller Club of
the United States.

Capt. THOS. A. SCOTT

National President of
The Propeller Club of
the United States.

The scientific laboratory is being provided by the National Propeller Club Convention and the American Merchant Marine Conference meeting jointly in San Francisco from October 21 to 24. The opinions and studies of experts will be made available to all. From the fields of finance, ship construction, marine insurance, world trade routes-conferences-traffic, labor relations, admiralty law and legislation, marine publications and public relations will come those leaders whose combined knowledge, experience and energy will build, propel and steer an industry which has potentialities seldom thought of by this and recent generations of shipping men. Major addresses, round-tables, private discussions, and general "bull sessions" will all point to these goals: How are we going to handle the problems resulting from the international emergency? How are we going to readjust ourselves after the emergency? What new fields or accomplishments are opened to us because of the close of one era and the beginning of another? How are we going to retain and develop these advantages?

Is it too early to be thinking of the future? It is true that the problems of dealing with the European and Far Eastern aggressors are more immediately important. Nevertheless, it is human nature to hesitate in making whole-hearted commitments and heavy expenditures or sacrifices until some general program of the future is diagrammed and analyzed.

It may be impossible later to live up to the plan, but at least the present ideas and ideals can be determined. If, when the horizon is reached, still newer problems are found ahead, at least we will have approached that far with confidence and determination and a readiness to proceed further.

In order to avoid too theoretical a laboratory, it is anticipated that the many discussions will include prospective policies of the Government in the event the United States is drawn into a more active phase of the present emergency.

Mention has already been made of leaders in the various fields of shipping. There are names familiar to us all: Admiral Emory S. Land, Captain Howard Vickery, H. Gerrish Smith, Lewis Luckenbach, Frank Taylor, Earl Anderson, Thomas Evans, Hon. Schuyler Otis Bland, Dr. Carroll Wilson, Rear Admiral A. H. Van Keuren, Mark O'Dea, William Jackson.

A remarkable opportunity will be granted those who attend the convention and conference to hear the discussions that will probably revolve around such questions as:

Will the second world-wide upheaval of this century project the United States into a more aggressive and lasting role in world affairs?

Will the American Merchant Marine be a vital factor in re-threading a pattern of world commerce?

Will American ships encourage the use of American dollars and American goods in rebuilding world-wide industry?

Will American flag shipping help win the peace as they are expected to win the war?

Can we increase the portion of world business handled in American bottoms?

How many ships will that business require?

On what financial basis can the 1,500 ships now building (and those that may be added) be diverted to practical employment after their emergency use is completed?

What is the commercial value of these vessels?

Will America's shipbuilding plants achieve a position of world importance in aiding to rebuild an international merchant marine?

Can our shipbuilding industry be made a vital peace industry as well as war industry?

Will ship owners and operators find a means of establishing adequate construction and purchasing reserves to revitalize their operations in the post-emergency period?

What technical progress has been made in ship construction under the Maritime Commission's and the private building programs?

How can conferences best achieve a stability in vessel operation that will help assure a soundly financed, steadily growing merchant marine?

What kind of international shipping organization can be considered that would remove disastrous competitive problems and promote shipping as a means of co-ordinating world-wide economic stability rather than as a weapon in economic conflict?

What can the American shipping industry propose as a program to sup-

J. LEWIS LUCKENBACH

Chairman, American
Merchant Marine
Conference Committee.

C. H. C. PEARSALL

Vice Chairman, American Merchant Marine
Conference Committee.

San Francisco is home port for American President Lines' superb new vessels . . . like the SS PRESIDENT JACKSON *pictured here.*

port the Roosevelt-Churchill Eight Points?

Do port authorities have constructive criticisms and suggestions to make in furthering the growth of domestic and off-shore shipping?

How can preferences in favor of and discriminations against domestic and foreign shipping in the international picture be most successfully controlled?

What legislative improvements to present merchant marine laws and what new laws and regulations are suggested by past experience, current problems, and situations that can be foreseen at this time?

How is the shipping industry going to improve its salesmanship and strengthen its relations with the millions of Americans who do not recognize or appreciate the direct connection of their welfare with the foreign commerce and international relations of the country?

What adjustment, if any, is necessary in our educational program?

How are labor relations within the industry to be stabilized so that the American public in general and shippers and prospective passengers and owners in particular will have confidence in a sound future for the industry?

What further support, if any, should we give the training program?

Are aviation and ocean transportation to be found in conflict or will they be co-ordinated in future advancement of international commerce?

How is marine insurance adapting itself to emergency conditions and what are the problems of readjustment after the current situation relaxes?

These are among the vital subjects to be mulled over in the October meetings in San Francisco.

Let us repeat, however, that the problems of today are not to be submerged by the delving into the future. The indications of policy that will undoubtedly be given by those in authority will go a long way toward answering many of the questions such as those outlined above.

We cannot leave this subject without emphasizing for the moment the tremendous opportunities that are before us. A policy was outlined by Congress in 1936 — an "adequate" merchant marine. The irony of the present crisis is experienced by the comparison of the then adequate 500-ship program with today's 1,500-ship schedule. Who knows what the "adequate" of the future will be?

However, the challenge has been given. Its acceptance by a determined and well-prepared Maritime Commission and a willing industry may well provide the impetus that will lead the Government, the importers and exporters, the bankers, the insurance companies, the manufacturers, and the other divisions of our economy into a far more active role in international affairs than has been visualized at any time since the days of the glorious clipper ships.

Will the shipping industry lead the way in revitalizing private initiative, in exploring and outlining the post-emergency relationship between government and business, and in illustrating an active policy of peaceful labor relations.

A level-headed practical discussion of immediate possibilities and future potentialities of the American Merchant Marine will be a valuable contribution to the economy of the whole country in the days of reconstruction and readjustment to a more normal life.

CHAS. L. WHEELER
President, Propeller Club
of the United States,
Port of San Francisco.

EDWARD H. HARMS
Your host!
General Chairman of the
1941 Convention-Conference.

The Convention and Conference will have the Fairmont Hotel as its home base.

San Francisco Host!

SAN FRANCISCO'S shipping and allied industries are to be complimented for the thorough-going manner in which they are preparing to serve as hosts this month to leaders of the maritime industry throughout the United States.

Local ship operators, ship builders and miscellaneous groups serving the industry have subscribed a fund sufficient to make this the greatest gathering of maritime leaders in the history of this country.

President Charles L. Wheeler and other shipping executives represented on the Propeller Club board of governors realized fully the responsibilities they were assuming when they accepted this convention and then set out to underwrite its cost among themselves. They were gambling with fate, hoping that America would not be at war and that the important conferences could be held as scheduled. By the same token, they knew that if the convention could be held, by the very nature of the times and world conditions, it would probably be the most important and significant gathering of shipping men ever held in this country. And they wanted this history-making conference to be held on the West Coast, in San Francisco.

San Francisco—the Mecca!

Bringing 300 delegates and their families to the Convention Conference, a "Propeller Club Land-Cruise

Special Train" will arrive in San Francisco 10:10 p.m., October 20th, for the opening of the conclave the following day. A total of 500 will be on the train. Some of the foremost shipping and shipbuilding leaders in the nation from river, gulf and ocean ports in the United States and its possessions, will be "shipmates" on this special.

Pullmans from Eastern cities will be joined at Chicago with those from the midwest and southwest cities, where the Propeller Special will be completed. With clear tracks the Propeller Club train will make only three stops en route: Boone, Iowa, where a barbecue will be staged; then a "Chuck-wagon" lunch in Cheyenne, Wyoming, and the third stop will be in Reno, "the biggest little city in the world" for a sight-seeing trip.

Charles L. Wheeler, president of the San Francisco Port, announces that officials of the national directorate of the Propeller Club and the American Merchant Marine will hold informal business sessions en route aboard the train.

Admiral Land acclaims selection of San Francisco

Sounding what will be the keynote of his address at the forthcoming annual conclave, Rear Admiral Emory S. Land, chairman of the United States Maritime Commission, who is to be a key speaker at the San Fran-

The Propeller Club of the United State

To Promote, Further and Support an
American Merchant Marine.

To Aid the Development of River,
Great Lakes and Harbor Improvements.

National Headquarters
17 BATTERY PLACE
New York, N. Y.

September 5, 1941

Mr. J. S. Hines, President
"Pacific Marine Review"
500 Sansome Street
San Francisco, Calif.

Dear Mr. Hines:—

A Special Edition of the "Pacific Marine Review" is always an event, but this splend illustrated issue of record planned by you for October, is not only a graceful gesture of intere and friendship for the Propeller Club activities, but will undoubtedly prove to be a genui contribution to the assured success of the Propeller Club Convention and American Mercha Marine Conference. We are all most appreciative.

The reports we are receiving here at Headquarters indicate that this year's Convention w surpass in both attendance and importance anything hitherto held by our nation-wide organiz tion. The addresses and general material available in advance of the Conference indicate th the entire marine industry is vitally interested in what will take place at San Francisco. It is goo to know that your excellent publication has undertaken to give the outstanding marine event the year special prominence under the attractive editorial policy of "Pacific Marine Review."

I am sure I need not emphasize the unusual importance of this year's Conference. With t world in turmoil, ocean transport has undergone vast changes some of which will prove to l permanent. The industry has had to rapidly readjust itself to new conditions, and we all face future of doubt and uncertainty based upon the many imponderables growing out of the w emergency.

Unfortunately, we have no definite precedent to guide us. All we have to go on from t last war emergency is the broader general outline. Practically all of the essential details a different. This opens up an enormous field for discussion which will find an outlet at the fort coming Conference.

Under the circumstances, a Special Edition such as you have scheduled for October, w be sure to meet an urgent need of the industry for journalism always anticipates the more labor and formal distribution of official texts and general post Convention data.

Many thanks for your generous cooperation,

Yours for American Shipping,

ARTHUR M. TODE,
Honorary President

ARTHUR M. TODE, *Honorary President, Propeller Club of the United States, receives Honorary Degree, Doctor of Law, in San Francisco, May 8th, this year.*

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National Headquarters
17 BATTERY PLACE
New York, N. Y.

September 5, 1941

r. J. S. Hines, President
acific Marine Review"
0 Sansome Street
n Francisco, Calif.

ear Mr. Hines:—

I am delighted to learn that you have arranged to publish a special edition of "Pacific arine Review" in October on the Propeller Club Convention and American Merchant Marine onference, convening in San Francisco October 21st to 24th.

Too much emphasis cannot be placed at this critical period upon the problems pressing from sides affecting our future as a maritime power. At present, our problem is one of rapid production of adequate tonnage and to properly man that tonnage. To properly maintain our essenl trade routes and services under the difficult conditions that will prevail after this world-wide nflict is worthy of our attention now.

In view of these facts it is gratifying to know that, as the publisher of an influential and dely circulated marine magazine, you have undertaken to stress in a Special Edition the usual importance of the Propeller Club Convention, which will as heretofore, contribute bstantially to considered thought on the many problems faced by the maritime industry.

This year's Conference will bring together under exceptionally attractive conditions, execues from all branches of the marine industry who will exchange ideas, formulate plans and aid, elieve, in successfully coping with problems of the day so vital to a privately owned American erchant Marine.

The Conference will provide fresh viewpoints through the unusually talented speakers, presentative as they are of Governmental functions and private interests that are all important successful ship operation.

Our friends in San Francisco and on the West Coast have always been sea-minded and rnest advocates of the American Merchant Marine. We are happy to greet them in a spirit of lidarity and comradeship for the advancement of a cause which is of vital national significance.

Very cordially yours,

T. A. SCOTT,
National President

M

cisco convention banquet, October 23rd, in a letter to Captain Thomas A. Scott, president of the Propeller Club, said in part: "Since the last meeting of the American Merchant Marine Conference and the Propeller Club, the United States Maritime Commission has added 1,093 vessels to its regular construction program. To place upwards of 1,200 new ships in operation by the end of 1943 is the goal of a supreme effort being made by the entire shipbuilding industry.

"Vital in these days of national emergency and defense, this expanded and revived merchant marine must also be ready to play its part in a post-war era in competing with other countries of the world to obtain that just share of the world's commerce upon which our country's prosperity depends.

"On this account I recommend that the Conference and the members of the Propeller Club give their attention to the necessity for careful and unbiased study of the problems to be met in order to establish a privately-owned merchant marine, requiring as it will public investment of funds in marine securities. Such a study will be necessary to protect our commerce, our trade relations and our trade routes.

San Francisco's most recent launching . . . the Steel Artisan at Western Pipe & Steel's yard at South San Francisco . . . on October 4th. Our picture shows sponsor, Mrs. William A. Ross, wife of the president of Columbia Steel Company, San Francisco. The gentleman is Howard Tallerday, head of Western Pipe & Steel.

"At a time when the sea lanes of the Pacific grow in importance, it is most appropriate that the great seaport of San Francisco has been selected as the scene of the 1941 American Merchant Marine Conference."

Broadcast

The full text of Admiral Land's address will be broadcast from the banquet room of the Hotel Fairmont the evening of October 23 from 9:30 to 10 p.m., P.S.T., over KGEI's short wave beam to Asia and will also be heard by all ships on the Pacific Ocean. Alaska, Hawaii, Wake, Midway Islands and New Zealand will also have the opportunity of listening to the chairman of the United States Maritime Commission.

The evening's address will be on 9,670 kc., 31.02 meters, beamed to Asia. The following morning, October 24th, 4:30 a.m., P.S.T., same frequency, beamed to Asia, there will be a rebroadcast. This particular broadcast will be heard by all ships in Asiatic waters, as well as the Philippines, China, Japan, Netherlands East Indies, and South Africa.

The Conference Speakers

ADDRESSES to be made at the American Merchant Marine Conference will be presented by a cross-section of leaders allied with every phase of America's maritime industry.

An advance report from Arthur M. Tode, Honorary President, to President Wheeler, stated that among the speakers who will be present with timely talks on the status of this country's Merchant Marine and its future program will be CARROLL D. WILSON, Director, Bureau of Foreign and Domestic Commerce; REAR ADMIRAL A. H. VAN KEUREN, Assistant Chief, Bureau of Ships, U. S. Navy; MARK O'DEA, Director of Information, U. S. Maritime Commission; SCHUYLER OTIS BLAND, Chairman, Committee on Merchant Marine & Fisheries, House of Representatives; CAPTAIN HOWARD L. VICKERY, Member, United States Maritime Commission; FRANK J. TAYLOR, President, American Merchant Marine Institute, Inc.; REAR ADMIRAL EMORY S. LAND, Chairman, U. S. Maritime Commission; R. E. ANDERSON, Director of Finance, U. S. Maritime Commission; EARL M. THACKER, President, Propeller Club, Port of Honolulu; COMDR. R. S. FIELD, Director of Marine Inspection and Navigation; REAR ADMIRAL R. R. WAESCHE, Commandant United States Coast Guard; CAPTAIN THOMAS A. SCOTT, President Propeller Club of the United States, and J. LEWIS LUCKENBACH, chairman of the American Merchant Marine Conference Committee.

The convention theme will be "Post War Reconstruction of Merchant Shipping and World Trade." As Mr. Wheeler pointed out in a recent speech aboard the California Maritime Academy training ship, "this conference will bring together the best minds in the industry, including ship builders and ship operators, marine architects and engineers, experts

H. GERRISH SMITH,
President National Council of American Shipbuilders.

R. EARLE ANDERSON,
Director of Finance U. S. Maritime Commission.

in foreign trade and commerce and the men in government charged with directing the future of America's maritime destiny. I visualize the conference chambers of this convention as a huge chartroom wherein the course for America's Merchant Marine will be set for the next twenty years."

In keeping with the theme, leaders of the Convention Conference have invited a group of distinguished educators, deans of Schools of Commerce and Marine Engineering to lead special panel discussions on problems confronting the industry.

Dr. Eliot Grinnell Mears, professor of international commerce at Stanford University, has already agreed to head up one of the discussion panels. Other educators, from California, Columbia and Massachusetts Institute of Technology, are expected to attend sessions.

"This phase of the convention," says President Wheeler, "represents a new departure in the conduct of a shipping conference. It is dictated by the seriousness of the situation which the industry now faces and which it will meet head-on when the war ends.

"With a thousand or more of the best minds in the business present under one roof, we feel that we should take full advantage of this opportunity to probe every phase of the maritime industry, and to resolve our findings into definite conclusions with reference to a long-range program for our merchant marine and the restoration of our foreign markets.

"This convention is a most timely one. Out of it may well come a new Magna Charta for our harassed maritime industry. Events of the past few years have proved that nothing is more vital to our national security and economy than a strong and highly efficient merchant marine."

Captain Howard L. Vickery, member of the United States Maritime Commission, has accepted the invitation to serve as presiding officer of the important sessions of the Conference.

Commander RICHARD S. FIELD,
Director, Bureau Marine Inspection &
Navigation, Department of Commerce.

FRANK J. TAYLOR,
President, American
Merchant Marine Institute, Inc.

EARL M. THACKER,
Past Commodore, Pearl Harbor Yacht Club
President, Propeller Club
Port of Honolulu, 1941.

CARROLL L. WILSON,
Director Bureau of Foreign &
Domestic Commerce
Department of Commerce.

Ahoy Propeller Delegates!

Some of America's most magnificent liners steam out of the Golden Gate.

National Officers—

Mr. Harry W. Parsons, Past National President
Propeller Club of the United States
Foster Wheeler Corp.
165 Broadway, N. Y. C.

Mr. Arthur M. Tode, Honorary President
17 Battery Place
New York

Mr. T. A. Scott, National President
Merritt Chapman & Scott Corp.
17 Battery Place, N. Y. C.

Mr. E. K. Sharlow, National Vice President
569 N. W. 64th St.
Miami, Fla.

Mr. J. Milnor Roberts, National Vice President
Bethlehem Steel Co.
1223 Oliver Bldg., Pittsburgh, Pa.

Mr. C. H. Pearsall
AGWI Steamship Lines, Inc.

Mr. David Pearsall, National Vice President
Santander Navigation Co.
Barranquilla, Colombia, S. A.

Lieut. Comdr. H. C. Moore, National Vice President
U. S. Coast Guard
Coast Guard Academy, New London, Ct.

Mr. L. V. Metz, National Vice President
L. V. Metz Construction Co.
Erie, Pa.

F. R. MacMahon, National Vice President
United Fruit Co.
Muelle de Santa Clara
Havana, Cuba

Capt. Wallace Langley, National Vice President
Santa Ana S.S. Co.
519 Colman Bldg., Seattle
Charles Kalloch, National Vice President
American Export Lines
25 Broadway, N. Y. C.
John Geistman, National Vice President
Marine Iron & Shipbuilding Co.
Duluth, Minn.
Cody Fowler, National Vice President
Citizens Bank Bldg.
Tampa, Fla.
Ira L. Ewers, National Vice President
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Massachusetts Institute of Technology
Cambridge, Mass.
Earl P. Carter, National Vice President
William & Voris Lumber Co.
Dobbs Ave., Chattanooga, Tenn.
George R. Alden, National Vice President
88 Leadenhall St., Cunard House
London, E. C. 3, England
Ralph J. Chandler, National Vice President
Matson Navigation Co.
312 Roosevelt Bldg., Los Angeles
Louis B. Pate, National Vice President
Mississippi Shipping Co.
Board of Trade Bldg., New Orleans, La.
J. H. Godwin, National Treasurer
The Texas Co.
Norfolk, Va.
H. J. Harding, National Secretary
95 Broad St.
New York City

The American Merchant

J. LEWIS LUCKENBACH, CHAIRMAN
American Bureau of Shipping
C. H. C. PEARSALL, VICE CHAIRMAN
AGWI Steamship Lines, Inc.
CHARLES L. WHEELER, VICE CHAIRMAN
McCormick Steamship Company
F. A. BAILEY
Matson Navigation Company
EDWARD J. BARBER
Barber Steamship Lines, Inc.
O. SLACK BARRETT
Miss. River System Carriers' Assn.
RALPH J. CHANDLER
Matson Navigation Company
JOHN W. CHAPMAN
Grace Line
JOHN E. CRAIG
Clyde-Mallory Lines
JAMES A. FARRELL, JR.
Amer. South African Line, Inc.
JOHN M. FRANKLIN
International Mercantile Marine Co.
GEORGE H. FRENCH
Maryland Dry Dock Company
ROBERT E. FRIEND
Nordberg Manufacturing Co.
JOHN F. GEHAN
American Export Lines
HENRY F. GRADY
American President Lines
A. B. HOMER
Bethlehem Steel Co.
B. B. HOWARD
Standard Oil Co. of N. J.
R. I. INGALLS
Ingalls Shipbuilding Corporation
A. C. INGERSOLL
Central Barge Company
WILLIAM K. JACKSON
United Fruit Company
H. C. JEFFERSON
Curtis Bay Towing Company
J. H. KING
The Babcock & Wilcox Co.
L. H. KORNDORFF
Federal Shipbuilding & Dry Dock Co.
ROGER D. LAPHAM
American-Hawaiian Steamship Co.
ROBERT C. LEE
Moore-McCormack Lines, Inc.
HARMON LEWIS
Alcoa Steamship Co., Inc.
JOSEPH T. LYKES
Lykes Brothers Company, Inc.
LACHLAN MACLEAY
Mississippi Valley Association
JAMES C. MERRILL
Merrill Stevens Dry Dock Co.
P. V. G. MITCHELL
United States Lines
JOSEPH A. MOORE
Moore Dry Dock Company
W. B. NEWELL
Bath Iron Works Corp.
D. W. NIVEN
General Electric Co.
C. J. PANNILL
Radiomarine Corp. of America
LOUIS B. PATE
Mississippi Shipping Company
N. O. PEDRICK
Louisiana Shipyards, Inc.
JOHN G. PEW
Sun Shipbuilding & Dry Dock Co.
JOHN D. REILLY
Todd Shipyards Corporation
E. A. ROBERTS
Waterman Steamship Corporation
THOMAS A. SCOTT
Merritt-Chapman & Scott Corp.
ALTON B. SHARP
Eastern Steamship Lines
H. GERRISH SMITH
Natl. Council of American Shipbldrs.
L. Y. SPEAR
Electric Boat Company
A. G. SPIEGELHALTER
The Pusey & Jones Corp.
V. J. SUDMAN
Black Diamond Steamship Line
RAYMOND D. SULLIVAN
South Atlantic Steamship Line
FRANK J. TAYLOR
American Merchant Marine Institute
ARTHUR M. TODE
Propeller Club of the United States
H. W. WARLEY
Colmar Steamship Corp.
ROGER WILLIAMS
Newport News Shipbldg. & D. D. Co.
A. T. WOOD
Lake Carriers Association

TO provide an open forum for the discussion of problems confronting the American Merchant Marine, The Propeller Club of the United States sponsored its first American Merchant Marine Conference in conjunction with its Eighth Annual Convention held at the Hotel Savannah, Georgia, November 1st, 2nd and 3rd, 1934. For several years previous, and including 1933, an annual Merchant Marine Conference was held at Washington, D. C., under the auspices of the United States Shipping Board. These conferences were discontinued when that body ceased to exist as an independent agency of the federal government. A program of addresses was presented at the 1934 Conference by outstanding leaders in their respective fields of activity, interspersed with discussions by members of the audience. Mr. James Craig Peacock, Director of the United States Shipping Board Bureau of the Department of Commerce, served as chairman.

Interest in the Merchant Marine Conference was stimulated through the detailing by the Navy Department of the U. S. S. *Tillman* to Savannah during the week of November 1st. The Coast Guard Commandant assigned the U. S. C. G. *Yamacraw* for the same period. The training ship U. S. S. *Empire State* of the New York State Merchant Marine Academy, with its full complement of cadets, was especially ordered to Savannah for the convention. This afforded the residents of that city as well as the delegates and others present an opportunity to observe first hand the facilities provided by the State of New York for the training and education of competent and well qualified officers for the American Merchant Marine.

The American Merchant Marine Conference and the educational campaign instituted and carried on by the Propeller Club to inculcate an appreciation of the importance of an adequate American Merchant Marine to our economic and social welfare received the warm endorsement of President Franklin D. Roosevelt who, in a letter dated September 26, 1935, to Arthur M. Tode, National President of the Propeller Club, wrote:

"I wish to extend to you my deep sense of the importance of the work you have undertaken and my hope that the objectives of the Conference will be achieved and a broad program formulated which will aid in gaining the needed legislation for the American Merchant Marine. The educational campaign you mention is much needed and I shall follow it with great interest. I agree that the need for American flag ships must be put back into the consciousness of the nation."

Encouraged by the interest displayed, the Propeller Club of the United States held its Second American Merchant Marine Conference in conjunction with its Ninth Annual Convention at the Hotel Waldorf Astoria, New York, N. Y., November 17th, 18th and 19th, 1935. In the work preliminary to the Conference and in the conduct of the Conference itself, the American Merchant Marine Conference Committee and the Pro-

Marine Conference

LOUIS B. PATE

APT. O. SLACK BARRETT
ississippi River Carriers Assn.

RALPH J. CHANDLER
South Pacific Coast Region

JOHN M. FRANKLIN
United States Lines Co.

DR. HENRY F. GRADY
sident, American President Lines

JOHN E. CRAIG
Clyde-Mallory Lines

GEORGE H. FRENCH
President of The Maryland Dry Dock Co.

ROBERT E. FRIEND
Nordberg Manufacturing Co.

JOHN F. GEHAN
American Export Lines

ARTHUR B. HOMER
Bethlehem Steel Company

B. B. HOWARD
Standard Oil Co. of N. J.

R. I. INGALLS
Ingalls Shipbuilding Corp.

WILLIAM K. JACKSON
United Fruit Co.

peller Club received the full co-operation of the Hon. Daniel C. Roper, Secretary of Commerce, who delegated the Hon. Joseph B. Weaver, Director of the Bureau of Navigation and Steamboat Inspection, to represent the Department of Commerce and act as Presiding Officer of the Conference.

Secretary Roper's active interest is evident in a letter addressed to the National President of the Propeller Club, in which he made the following suggestion:

"It seems to me that the Propeller Club of the United States can render valuable aid prior to the holding of the Conference by attempting to secure from the shipping industry some solidified expressions of opinion on our merchant marine problems. The lack of unanimity in the shipping industry with respect to a broad national policy and program retarded and handicapped the efforts to pass legislation for shipping aid at the last session of the Congress. It is hoped the Conference will be successful in bringing the shipping interests unselfishly together for the common good of the industry and to determine, if possible, a consensus of opinion as to a general cooperative program between government and business."

In conjunction with its Tenth Annual Convention held at the Hotel Statler, Boston, Massachusetts, September 28th, 29th and 30th, 1936, the Propeller Club of the United States again sponsored an American Merchant Marine Conference which was presided over by the Hon. J. Monroe Johnson, Assistant Secretary of Commerce.

The American Merchant Marine Conference held at the Hotel Peabody, Memphis, Tenn., October 11th, 12th and 13th, 1937, under the auspices of The Propeller Club's Eleventh Annual Convention was presided over by the Hon. Thomas M. Woodward, member of the United States Maritime Commission. At Baltimore, Md., there was held on September 18th, 19th and 20th, 1938, the American Merchant Marine Conference in conjunction with the Twelfth Annual Convention, presided over by Rear Admiral Emory S. Land, U. S. N., Rtd., Chairman of the United States Maritime Commission. Again in 1939, Admiral Land served as presiding officer when on October 8th, 9th and 10th there was held the American Merchant Marine Conference at the time of the Thirteenth Annual Convention of The Propeller Club of the United States.

CAPT. H. C. JEFFERSON
Curtis Bay Towing Company

L. H. KORNDORFF
Federal Shipbuilding & D. D. Co.

ROGER D. LAPHAM
President of American-Hawaiian S. S. Co.

JOSEPH T. LYKES
Lykes Bros. Steamship Co., Inc.

•

American Merchant Marine Conference Committee Members

•

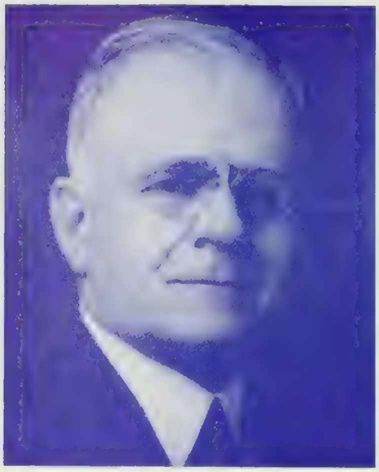
C. H. C. PEARSALL
AGWI Steamship Lines, Inc.

P. V. G. MITCHELL
United States Lines

JOSEPH A. MOORE
Moore Dry Dock Co.

WILLIAM B. NEWELL
Bath Iron Works Corp.

NORMAN O. PEDRICK
President of Mississippi Shipping Co.



JOHN G. PEW
Sun Shipbuilding & D. D. Co.

ROBERT C. LEE
Moore-McCormack Lines

J. C. PANNILL
Radiomarine Corp. of America

American Merchant Marine Conference Committee Members

E. A. ROBERTS
Waterman Steamship Corp.

L. Y. SPEAR
Vice President of Electric Boat Co.

V. J. SUDMAN
Black Diamond Steamship Corp.

JOHN D. REILLY
Todd Shipyards Corp.

the Convention Spotlight !

EDGAR M. WILSON
First Vice President
at Los Angeles

BENN BARBER
Resolutions Committee
of the Conference

OUIS B. PATE
eneral Chairman of
1940 Convention

HARRY W. PARSONS
Past National President

EUGENE F.
HOFFMAN
Secretary of the
hosting port

MRS. ARTHUR M.
TODE
Past President, Women's
Organization for the
American Merchant
Marine, Inc.

San Francisc

By

ROBERT D. SPEAR

Chairman,
Entertainment Committee
Port of San Francisco

"We know that we will have a good time in San Francisco!"

THESE words, heard on all sides at the new Orleans convention last year, have been the watchword of the Entertainment Committee. With this in mind, your committee men have tried to arrange a program, which, together with the traditional hospitality of San Franciscans, will come up to your expectations.

Convention headquarters at Hotel Fairmont make a convenient center for our activities. High up on Nob Hill, with a sweeping view of the city, San Francisco Bay, the bridges and surrounding hills, it is close to the center of the city's social and business life.

Your first day, Tuesday, October 21st, is open for registration, looking up old friends and meeting new ones, shopping, sight-seeing, etc. For golfers—the annual golf tournament at Olympic Club's famous Lakeside course begins at noon.

Taxis will be provided to take you from the Fairmont to a 6 p.m. cocktail party at the St. Francis Yacht Club, then back to the Fairmont for the Buffet Supper and Informal get-together tendered to delegates and visitors by the Propeller Club, Port of San Francisco.

During the evening you will witness the "Water Follies," an aquatic entertainment under the direction of Phillip Patterson, coach of the Fairmont Swimming Club, and held in the Terrace Plunge, adjacent to the Terrace Ball Room. Miss Helen Crlenkovich, U. S. Women's Diving Champion, in an exhibition of the diving which has made her famous, the Sea-Maids Water Ballet, the Water Waltz, and comedy diving by Claude Diaz and Norman Hanley of the Olympic Club, are some of the highlights of this event.

Then follows a full evening of dancing to the music of Carvel Craig and his orchestra, who will come from Monterey Peninsula's Hotel Del Monte to play for our convention.

Plans are virtually completed at this writing for intermission entertainment selected from San Francisco's cosmopolitan supper clubs.

Our entertainment for Wednesday evening is centered at the beautiful Claremont Country Club in Oakland. Transportation will be provided from the Fairmont across the San Francisco-Oakland Bay Bridge! A cocktail party, followed by the President's dinner, tendered by the Propeller Club, Port of San Francisco, is scheduled for 5 p.m. This will be held out of doors in a stately grove of California Redwood trees . . . *with the dinner served in Western barbecue style.* From the grove, we move into the clubhouse for the President's reception and dance. This will be an informal sports affair, with Hawaii

Offers

This Official Program

MONDAY—October 20th

Registration for Members, Port of San Francisco and other West Coast Ports.

TUESDAY—October 21st

Meetings of National Committees
  Credentials Committee
  Constitution and By-Laws Committee
  Overseas Propeller Clubs Committee
  Public Education Committee
  Nomination Committee
  Resolutions Committee
  Student Ports Committee

National Board of Governors Meeting

Sixth Annual Meeting of the Women's Organization for the American Merchant Marine, Inc.
  in conjunction with
The Ladies' Committee of the Propeller Club, Port of San Francisco

Fairmont Hotel

Annual Propeller Club Golf Tournament

The Olympic Club at Lakeside

Cocktail Party tendered to delegates and visitors by the Propeller Club, Port of San Francisco

St. Francis Yacht Club

Buffet Supper tendered by the Propeller Club, Port of San Francisco

Fairmont Hotel

Aquatic Entertainment

Terrace Plunge—Fairmont Hotel

Informal Reception, Dance and Get-together Party

Fairmont Hotel

WEDNESDAY—October 22nd

Opening Session, Propeller Club of the United States

Gold Ball Room

Shopping Tour of Chinatown followed by Luncheon in Chinatown tendered to visiting ladies by the Ladies' Committee

Cocktail Party, followed by President's Dinner tendered by the Propeller Club, Port of San Francisco

Claremont Country Club, Oakland

President's Reception and Dance tendered by the Propeller Club, Port of San Francisco

Claremont Country Club, Oakland

THURSDAY—October 23rd

First Session, American Merchant Marine Conference

Gold Ball Room

Luncheon tendered by the Propeller Club, Port of San Francisco to the members of the American Merchant Marine Conference Committee, and National Board of Governors of the Propeller Club of the United States

Top of the Mark

Luncheon tendered to visiting ladies by the Ladies' Committee at the Cliff House, followed by sightseeing auto tour of San Francisco

Second Session, American Merchant Marine Conference

Gold Ball Room

Reception in honor of Distinguished Guests and Conference Speakers

Fifteenth Annual Banquet of the Propeller Club of the United States in conjunction with the American Merchant Marine Conference Committee and the Women's Organization for the American Merchant Marine

Terrace Ball Room, Fairmont Hotel

Grand Ball

FRIDAY—October 24th

Second Session, Propeller Club of the United States

Gold Ball Room

National Board of Governors' Meeting

Harbor Sightseeing Trip and Buffet Luncheon and the South Seas, influencing the music and entertainment.

The famous Gold Ball Room of the Fairmont Hotel is the scene of the annual ball on Thursday evening, following the banquet and bringing our evening's entertainment to a fitting close.

Special entertainment for the ladies has not been overlooked, and many events have been scheduled for them. Under the auspices of the Ladies' Committe, Chinese guides will conduct a tour of San Francisco's world-famed Chinatown on Wednesday morning, followed by a luncheon at the Far East Cafe.

On Thursday a luncheon will be tendered to visiting ladies by the Ladies Committee at the Olympic Club at Lakeside, followed by a sightseeing tour of San Francisco.

A visit to San Francisco would not be complete without rides on the cable cars and ferryboats. Cable cars run past the Fairmont, taking one to the Ferry building, Fishermen's Wharf, theatres and many other places. Since the advent of the bridges, ferryboat operation has been almost eliminated, but we have arranged a boat trip for Friday afternoon, with music and refreshments, which will give you a ride of from two to three hours and bring you close to the docks, bridges, Alcatraz, Treasure Island, and many other points of interest on the Bay.

There will probably be many other features of the San Francisco Bay area which will claim your interest, and about which you will want information. General Convention Headquarters, and also the Ladies' Committee Headquarters, at the Fairmont are at your service to answer questions and to arrange visits to places you may have heard of and wish to see.

So come to San Francisco October 21 to 24, bring your friends and leave the rest to your hosts, The Propeller Club, Port of San Francisco.

JOSEPH A. MOORE

Chairman of the Board of Moore Dry Dock Company, Oakland, member of the Board of Governors of the Port of San Francisco Propeller Club.

As we go to press, Mr. Moore is making plans for launching the next ALCOA *ship at his yard on October 21st . . . a colorful event, which every delegate to the Convention-Conference will want to attend! The ship*—ALCOA COURIER. *The sponsor*—MRS. ROY A. HUNT.

For the Ladies of the Convention-Conference

MRS. CHARLES L. WHEELER
Chairman, Ladies Committee

ARRANGEMENTS have been oncluded for the complete enjoyment f your visit to the Pacific Coast. We lan to have you "see everything and lo everything" that will make your rip a life-long happy memory.

We ladies of San Francisco (and ur men too) are hoping for an opportunity to show you a Royal Good Time. San Francisco is famed around he world for its hospitality, and we vant to prove that is no idle boast. And we know too that your men folk vill be happier if they know you are having fun" too.

San Francisco . . . the City by the Golden Gate, with its magnificent bridges, connecting Marvelous Marin on one side and the East Bay on the other; with its seven hills, topped by towering apartment hotels with their breath-taking skyroom views . . .is a vision you will never forget.

But let's get practical and talk about the events planned for your entertainment, and "what to wear!" San Francisco women love dark clothes, tailored suits, fur jackets or medium weight top-coats. We wear practically the year 'round what you in the East wear in early fall. Daytime may be warm, when you won't need a wrap, but always in late afternoon and evening you will need your short fur jacket or medium weight top-coat.

MRS. ROBERT D. SPEAR
Vice-chairman

MRS. E. N. W. HUNTER
MRS. HUGH GALLAGHER
MRS. BERNARD DE ROCHIE

MRS. WILLIAM RADNER
MRS. JAMES SCOTT
MRS. JOHN GREANY
MRS. CLYDE WILLIAMSON

All entertainment planned will be informal except the closing banquet when the men will wear dinner jackets and therefore dinner or evening dress for the ladies will be indicated. For the luncheon and shopping tour in Chinatown you will want dark silk or wool things, and most important, a comfortable pair of walking shoes. For the barbecue and dance at beautiful Claremont Country Club, spectator or active sports attire will be in order. If silk dresses are preferred, do bring along a sweater.

MRS. D. N. LILLEVAND
MRS. GEO. E. SWETT
MRS. LEWIS MESHERRY

MRS. MESHERRY and
MRS. EDWARD HARMS

If you plan to visit California's Southland—Santa Barbara, Los Angeles or San Diego—you'd better find a corner for some summerish clothes. They dress lighter in the South than they do in the San Francisco Bay area.

MISS VIRGINIA GREANY

MRS. JOSEPH LUNNY
MRS. BAILEY

Finally, when you register, please indicate your preference in specialized activity. If it's sports, just mention your favorite — golf, tennis, swimming, bowling, etc. If you would prefer to visit our art galleries or browse through our many exclusive shops, just name your pleasure. Suffice to say, your pleasure will be our pleasure.

In the meantime, Aloha 'till October 21st.

Very sincerely yours,
(Mrs.) Charles L. Wheeler,
Chairman, Ladies' Entertainment
Committee.

EDWARD HARMS
MRS. ROBT. D. SPEAR
EUGENE F. HOFFMAN

MRS. SPEAR
MR. WHEELER
MRS. LILLEVAND

MRS. JAMES S. HINES
MRS. J. F. McCONKEY

MRS. FRAZER BAILEY
MRS. SPEAR
MISS GREANY
MR. HARMS

MRS. FRAZER A. BAILEY

MRS. D. N. LILLEVAND

MRS. JOHN CLERICO
MRS. SAM HAWKINS

MRS. SPEAR
MRS. BYRON PICKARD
MRS. EUGENE F. HOFFMAN

CHAS. L. WHEELER,
President

ROGER D. LAPHAM

A. S. GUNN

San Francisco's Official Hosts

JOHN ELDRIDGE CUSHING

The Port of San Francisco

Charles L. Wheeler
President

John E. Cushing
First Vice-President

Arthur B. Poole
Second Vice-President

Hugh Gallagher
Third Vice-President

Eugene F. Hoffman
Secretary-Treasurer

BOARD OF GOVERNORS

Frazer A. Bailey
Capt. Henry Blackstone
John E. Cushing
Fred L. Doelker
Hugh Gallagher
A. S. Gunn
Edward H. Harms
George Jordan
Roger D. Lapham
Marshall Levis
Ira S. Lillick
Capt. Lewis Mesherry
Joseph A. Moore

JOSEPH A. MOORE

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ARTHUR POOLE
Finance

EDWARD H. HARMS
General Chairman

JOHN DAVIDSON
General Secretary

EDWARD MAUSSHARDT
Publicity Vice-Chairman

JOSEPH A. MARIAS
Reception

ROBERT FOUKE
Transportation

D. N. LILLEVAND
Entertainment

On the right side of the table is John (center), vice chairman, Golf Committee. Mrs. Greany and daughter Virginia are both stalwart workers on the Ladies Committee.

Photo was taken at the Los Angeles-San Francisco rally last April.

GEORGE E. SWETT
Vice-chairman, Entertainment

J. P. McARTHUR
Entertainment

LONNIE OWENS
Vice-chairman, Transportation

J. F. McCONKEY
Entertainment

JOSEPH A. LUNNY
Chairman, Golf

C. M. LE COUNT
General Treasurer

FRANK FOX
Entertainment

PROPELLER CLUB
OF THE
UNITED STATES
OF SAN

Tomorrow's Ship Officers Invited

PROPELLERS of the Port of San Francisco paid their respects to United States Maritime Commissioner Capt. Edward Macauley on the occasion of his visit to the Coast during August by staging a special dinner-meeting program aboard the California Maritime Academy's training ship, berthed alongside Pier 56.

Hosts were officers and cadets of the Academy who provided an excellent dinner served in true shipboard fashion. Inspection tours above and below were also enjoyed.

The program was well planned affording the San Francisco Propellers the opportunity of inviting the Academy faculty and undergraduates to partake of the advantages of the Convention-Conference coming up in October.

Capt. Macauley was introduced by

PRECEDING PAGE:

Our full page plate shows United States Maritime Commissioner CAPT. EDWARD MACAULEY *addressing audience of cadets and Propeller Club members aboard the California Maritime Academy Training Ship.*

EDWARD MAUSSHARDT, *district manager for the U. S. M. C., is welcomed aboard by Cadet President,* JACK ZENOR.

TELFAIR KNIGHT, *of the U. S. M. C. training division, was a distinguished guest.*

Officers of the Training Ship made an impressive receiving line as guests came aboard. Left is Chief Engineer of the vessel, R. C. DWYER.

Executive Officer B. M. DODSON *was called on for remarks. He was the "spark plug" of arrangements. Seen in his audience are* WALTER J. WALSH *and* ROBERT FOUKE, *prominent Propellers.*

This Year — it's San Francisco!

ROBERT YOUNG *of the Engineers Department gave an alluring account of last year's round the Americas voyage of the C. M. A. Training ship.*

ROBERT WILSON *represented the Deck Department and likewise took us on a graphic voyage. His talk sparkled with anecdotes which struck responsive chords among his shipmates.*

THE PROPELLER CLUB OF THE UNITED STATES
PORT OF SA...CO
THE PROPELLER OF THE UNITED STATES
PORT OF CALIFORNIA MARITI...

PROPELLER CLUB OF THE UNITED STATES
OF SA...
THE
PORT OF

Commander of the vessel CAPTAIN CLAUDE B. MAYO *(right)* and ITALO CANEPA, *first officer.*

President Charles Wheeler, and gave an inspiring talk especially directed to the cadets, whom he called the Ship Officers of Tomorrow. Particularly apropos were the Commissioner's remarks by reason of his recent officiating at the dedication of the *American Sailor*, ship of the Training Division at Port Hueneme, California.

Capt. Henry Blackstone was at the head of the gangplank to greet the arrivals. As shown in one of our photographs, an impressive array of the ships' officers stood by to welcome guests. A tour of the ship followed . . . and then the call to mess was piped for all hands.

Appearing on the program with our distinguished guest, Capt. Macauley, were several cadets who recounted past cruises of the schoolship. Mr. Wheeler also presented Edward Harms, general chairman of the Convention, who urged the young men to come aboard for the big event.

PMR's staff photographer tells the rest of the story of this colorful meeting through the accompanying halftones. It was a grand evening and our compliments go to Byron Pickard, chairman of the Program Committee and his lieutenants, to Capt. Blackstone, to Capt. Mayo, Commander, and to Capt. B. M. Dodson, Executive Officer of the C. M. A.

CHAS. WHEELER, *Port of San Francisco president introduced the several speakers.*

Rally at Los Angeles

These views show first rally last Spring at Los Angeles and San Francisco get-together at Del Monte.

That's Chas. Wheeler in the top picture and president (at that time) RALPH CHANDLER, *Los Angeles, in the other view.*

"We're with you, San Francisco!"

LOS ANGELES is making big plans, typical of the fine spirit which characterizes the men of that maritime district, for participation in the October Convention and Conference.

Last spring a joint meeting of the two Ports was held in Del Monte, at which time early enthusiasm was engendered. That this cooperative spirit is still glowing warmly was manifested by the Los Angeles Club's invitation for Chairman Edward Harms, San Francisco Secretary Eugene F. Hoffman and Captain Lewis Mesherry, "Ambassador-at-Large," to come down to attend a special pep-meeting which occurred at the Los Angeles Athletic Club on September 5th.

To this meeting Fred A. Hooper, who is American-Hawaiian's district manager and President of the Port of Los Angeles Propellers, gathered the leaders of the organization—men who are determined that their city's place in the Convention's spotlight will be commensurate with the importance of the Southern California seaport.

Chairman Ed and his two aides were royally welcomed and the success of the get-together has already been evidenced by reservations which have followed.

Now for some "flash" news out of Los Angeles which reaches us from Norman Dunnavant, our publicity correspondent . . . as we go to press:

The 3 H's!
HARMS,
HOOPER,
HOFFMAN

Seventeen new members were welcomed into the membership of the Port of Los Angeles No. 66, at the first luncheon meeting of the fall season under the regime of President F. A. Hooper, district manager of the American-Hawaiian Steamship Company, held September 26th at the Los Angeles Biltmore. The new members, all taken in since July 1, were introduced to the one hundred members and guests assembled for the "Liberty Fleet Day" meeting, by Harry J. Summers of the American Bureau of Shipping. Official welcome on behalf of the club was extended by

Please turn to page 170

Reading from left to right—J. L. Hook, Jr., district manager, McCormick Steamship Company; Abe Rosenfeld, Commissioner, L. A. Harbor Department; L. H. Connor, operating manager, Wilmington Transportation Co.; Norman Dunnavant, publisher, Daily Shipping Guide and Commercial News, secretary-treasurer, Propeller Club, Port of L. A. #66 and vice-chairman of the local convention committee; and Owen E. Durkin, manager, Marine Exchange.

Left to right: Howard Wickersham, manager of W. H. Wickersham & Co., and chairman Los Angeles Convention Committee; Edgar M. Wilson, general agent, American President Lines, and first vice president of the Propeller Club, Port of Los Angeles; Carl F. Fennema, vice president and general manager, Wilmington Transportation Co.; Fred A. Hooper, district manager, American-Hawaiian S.S. Co., and president, Propeller Club, Port of Los Angeles; Harry J. Summer, principal surveyor, American Bureau of Shipping, and second vice president, Propeller Club, Port of Los Angeles; Ralph J. Chandler, district manager, Matson Navigation Co., past president of the Propeller Club, Port of Los Angeles.

Rear Admiral E. S. Land, Chairman of the U. S. Maritime Commission, and Russel J. Carroll, Chief Construction Engineer for U. S. M. C. at the Richmond Shipbuilding Corporation, Richmond, Calif.

Ready for launching at Tacoma

"Liberty Fleet Along The

From Puget Sound to Long Beach Six Shipyards Launch Seven Big Hulls in Seven Hours Sept. 27

Saturday, September 27 (designated "Liberty Fleet Day" by the Maritime Commission) was a great and joyous day for the shipbuilders and the shipbuilding fans on the Pacific Coast. On that day, six shipyards from Puget Sound to Long Beach harbor launched seven fine hulls and were hosts to an army of visitors, aggregating over 100,000 inside the yards and uncounted multitudes who viewed the launchings from outside vantage points. Elaborate programs of music, oratory and entertainment were presented at most of the yards. The weather was kind and presented the yards with a perfect fall day.

On the United States sea coast on "Liberty Fleet Day," a total of 14 ships were launched. Three of this total were the new emergency cargo steamers ("Liberty Ships"); two were the British emergency type; one was a cargo and passenger C-3 type; two were C-3 cargo ships; one was an army transport; one was a C-2 cargo ship; three were C-1 cargo vessels; and one a tanker.

Pacific Coast is proud that her contribution to these launchings represents 50 per cent of the total, and that out of three "Liberty Ships" ready for launching, two were launched from her shipyards.

Chief characteristics of these vessels, as conceived in the original plans, are minimum cost, rapidity of construction, and simplicity of operation.

Dimensions, "Liberty Ship"

Length overall	441 feet 6 inches
Length waterline	428 feet
Beam	57 feet
Draft (loaded)	27 feet 8 inches
Gross tonnage	7,500 tons
Deadweight	10,500 tons
Displacement	14,100 tons
General cargo	9,146 tons
Bale cubic capacity	468,000 cubic feet
Number of holds	5
Number of decks	2
Boilers	2 water tube
Shaft horsepower	2500
Normal speed	10 to 11 knots
Normal complement	44
Passenger accommodations	none
Approximate average cost	$1,610,000

An emergency ship of British design, 60 of which the British Government had ordered for their account in American shipyards, was followed closely in determining the features of the projected "Liberty Ship," thus making the EC-2 fleet readily adaptable to operation by British crews and to emergency repairs in virtually any port in the world.

Of the single screw, full scantling type, with raked stem and cruiser stern, the hull is subdivided by seven main bulkheads providing five cargo holds. The engines and boilers are located amidships in a single compartment. General characteristics are shown on the table herewith. These vessels will be driven by a single screw, direct connected to a triple expansion reciprocating steam engine. Steam will be generated in two oil-burning water tube boilers.

The cargo gear is designed for simplicity of operation to meet the handling difficulties likely to be encountered in foreign ports. Steam-driven winches are used throughout. Emergency equipment will be complete to the last detail, in keeping with the latest refinements adopted by the British Ministry for wartime operation.

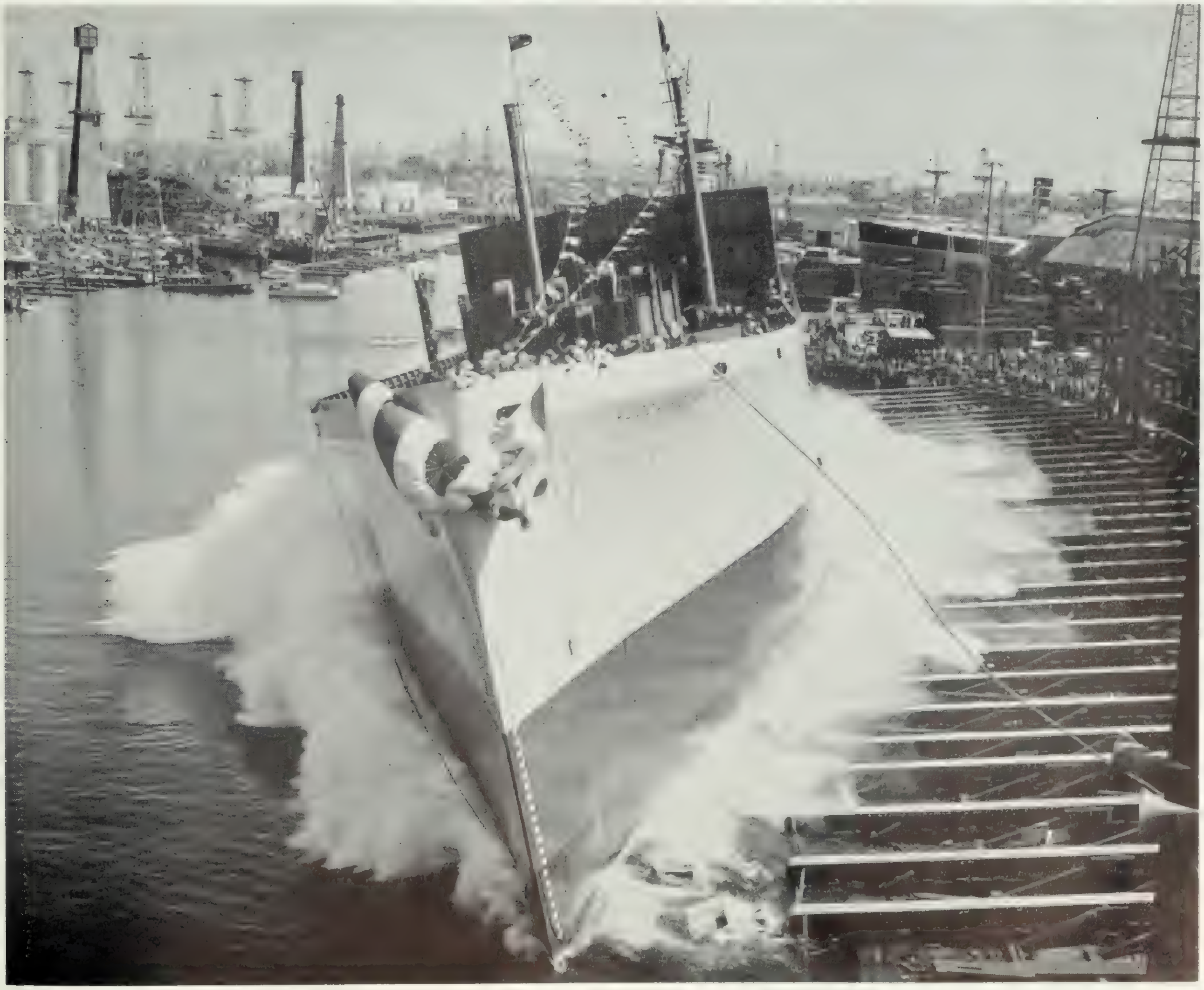
The "Liberty Ship's" normal complement of 44 officers and crew are well provided for. Their quarters, though somewhat smaller than those being built into the Government's long-range program ships, are nonetheless modern, clean and comfortable. The officers' and crew quarters are all in one house, thus eliminating the need for passing over weather decks for messes, etc. They boast the most modern sanitation facilities, with a maximum of four men in a room, and superior quality mattresses and berths.

More than half of the 79 new shipways, which are being built in nine shipyards to handle the "Liberty Fleet" construction program, are already in operation. And as fast as one shipway is vacated by a launching, the keel plates for another hull will be laid. Before the end of 1941 it is contemplated that about 20 of these "Liberty" vessels will be ready for service.

Six months will have elapsed from the date the John C. Freemont's keel was laid (May 24) until she will be ready, as now estimated, for delivery (about November 24). The same in-

Day" Pacific Coast

Above: Poised for launching at Long Beach. Below: An unusual launching shot, showing the beautiful hull of Alcoa Polaris just leaving the ways at Long Beach.



terval of time will have elapsed between the keel laying (May 19) for Star of Oregon and estimated delivery (November 25). At peak capacity, however, when all the expanded shipyard facilities have been completed, the Maritime Commission forsees a production speed of four and a half to five months for the "Liberty Ships," of which only three months will be required on the ways. In fact, the dates set for the James Otis, whose keel was laid at Richmond Shipbuilding Corporation on September 17 are, launching October 26; delivery, December 25.

Above: Launching party at Consolidated steel yard.

Below: Driving wedges in stern poppet just before launching.

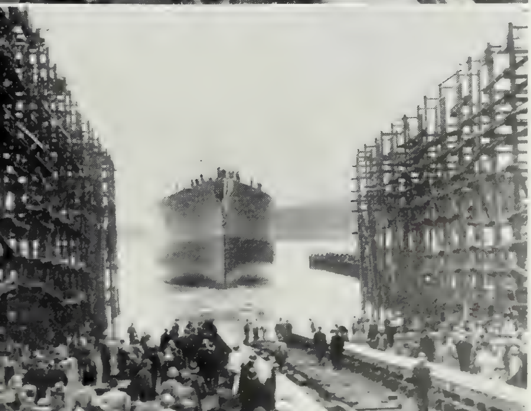
Alcoa Polaris just off the ways.

Alcoa Polaris afloat in mid channel and snubbed by her bow hauser. (Photos by Roger Sumner).

Because of time and space limitations, we are confining this article to the Pacific Coast launchings on "Liberty Fleet Day" and will leave the launchings from other sections to the November issue.

The Pacific Coast launching parade on September 27 began 10:15 a.m. at Long Beach, California, when the good C-1-B cargo steamer slid sidewise into the inner harbor with her nose dripping champagne, after having been duly christened Alcoa Polaris by Mrs. Wm. Holzhauer, wife of the general manager of the Aluminum Company of America.

Ralph J. Chandler, national vice-president of the Propeller Club of the



ce of the initial dip of the U. S. Army transport Frederick
n at Tacoma. (Photos by Turner-Richards, Tacoma)

☜ Frederick Funston ready to be christened.

●

Miss Barbara ☞ Funston ready to bestow the family title on her grandfather's namesake.

●

☜ The big transport hull at the end of the ways—her stern afloat—getting her first feel of sea water.

●

☜ Fully afloat and acclaimed by her well-wishers.

●

At the outfitting ☞ dock to be equipped for her life on the ocean.

United States, and vice president of the Matson Navigation Company, was master of ceremonies. He introduced Franklin Delano Roosevelt, President of the United States, who by transcription spoke to the people of Long Beach and to the personnel of the yard and their guests. Said he:

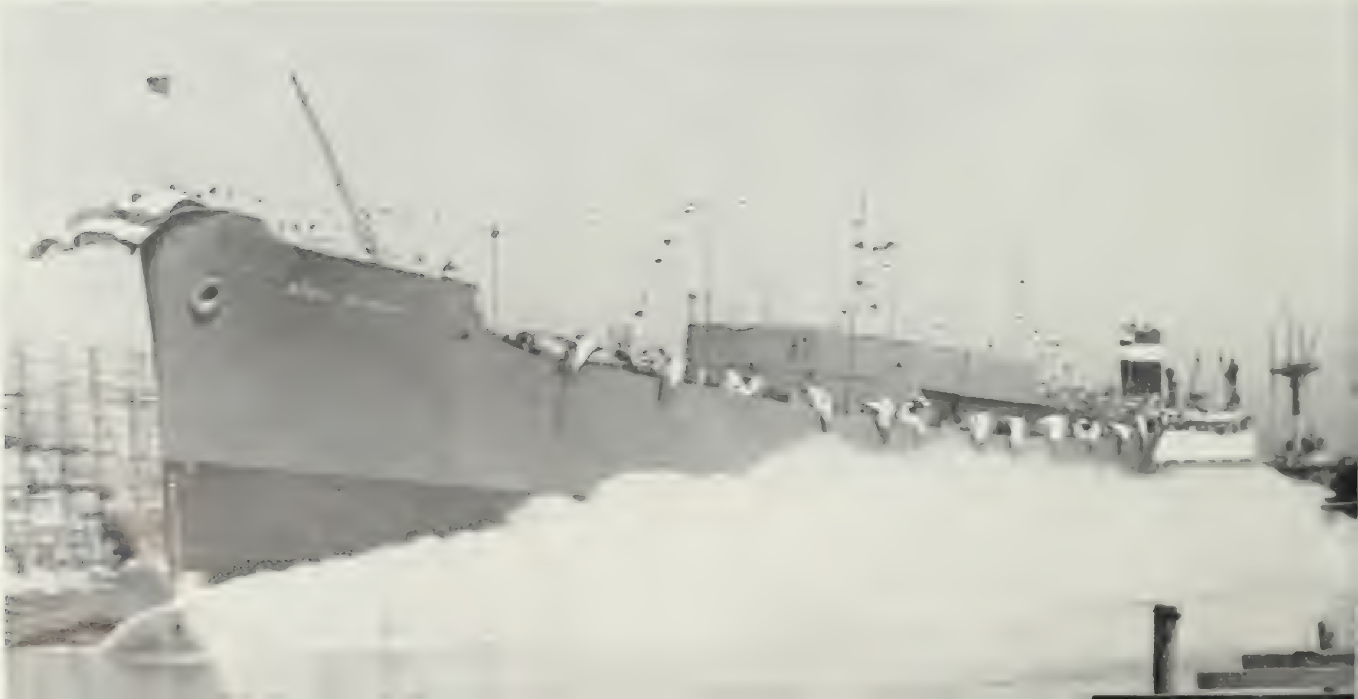
"You shipworkers of America are doing a great job. You have made a commendable record for efficiency and speed.

"With every new ship you are striking a telling blow at the menace to our nation and the liberty of free peoples throughout the world. You struck fourteen such blows today. You have caught the true spirit with which all this nation must be imbued if Hitler and other aggressors of his ilk are to be prevented from crushing us."

Steel Artisan Plops in at South San Francisco

Left, the sponsor and the legionnaires salute the colors. Right, Howard Tallerday, president, Western Pipe & Steel Co.; Mrs. W. A. Ross, sponsor; Archibald King, vice president, Isthmian S. S. Co.; and J. B. Meurk, superintendent, Isthmian S. S. Co.

Steel Artisan drops into the basin at South San Francisco with a big splash
—Photos by Stroupe, S. F.



Mr. Chandler then introduced Captained Edward Macauley, U. S. Maritime Commissioner, who said, in part:

"When the Alcoa Polaris slipped easily into the water today, I got the same old thrill; only this time I felt an additional pride that she was destined to play a part in deciding the most crucial struggle in which our country has ever been engaged, for we are engaged in a struggle just as truly as if we were at war, and just as important for the future of our country.

"In this kind of war, the men and women in defense work are the front-line troops, and there is no sector more vital than this of shipbuilding."

Launching of Frederick Funston

While this program was under way at Long Beach, a launching crew were adjusting the wedges under bow and stern poppets for a C-3 hull in the Tacoma yard of the Seattle-Tacoma Shipbuilding Corporation, some 1200 miles north. This hull is to be a U. S. Army transport and was named for the celebrated General Frederick Funston, who prosecuted the Philippine War so successfully, captured Aguinaldo, and later made himself dear to the heart of every true citizen of San Francisco by his stern but wise administration of that city after the 1906 earthquake and fire. A granddaughter, Miss Barbara Funston of San Francisco, acted as sponsor. Speeches included radio transcription of President Roosevelt's address. Several Army and civil dignitaries made brief addresses, and the good ship glided down onto the waters of Commencement Bay. The launching itself is shown in the illustrations better than in many words of description.

Steel Artisan Plops Sidewise

At 12 noon the South San Francisco yards of the Western Pipe and Steel Co. was the mecca for every inhabitant of the San Francisco Peninsula. Here was to be launched the largest hull ever to slide off sidewise on the Pacific Coast, the C-3 hull of a cargo steamer building for the U. S. M. C. and the Isthmian Steamship Co.

The sponsor at South San Francisco was Mrs. W. A. Ross, wife of the president of the Columbia Steel Company, San Francisco subsidiary of the U. S. Steel Co., owner of the Isthmian Steamship Company. She performed her duties graciously and efficiently, producing the beautiful bubble shower seen in our illustration. The big hull, properly christened Steel Artisan, kicked up the biggest splash yet seen in San Francisco Bay.

Here the eloquent words of Rear Admiral Emory S. Land, Chairman U. S. M. C., in his nation-wide "Liberty Fleet Day" broadcast seem very fitting:

"Under the Act of 1936, the Maritime Commission was created not only to re-establish the American merchant marine but to provide auxiliary ships for the nation's armed forces—for the Navy and the Army. Some of the vessels now being built are to be utilized for that purpose, just as have 150 which the Commission already has turned over to the Army and the Navy during the present emergency.

"With the far-flung bases that are being established by our nation throughout the world, and particularly in the Western Hemisphere, these auxiliary ships are playing a vital part in our defense. Many of the finest and most efficient vessels the Maritime Commission has designed and built for American shipping operators have been diverted from their intended merchant marine use to the nation's combat service. It should be gratifying to the people of America to know that *these operators have willingly and uncomplainingly subordinated their own interests to the welfare of their country,* even at a time when merchant ships are at a premium and their operation means assured profit.

First Pacific Coast "Liberty Ship"

A great crowd thronged the yards of the outfitting piers of California Shipbuilding Corporation on Terminal Island, Los Angeles Harbor, to see the first hull of 55 "Liberty Ships" to be built at this yard slide into the waters of Cerritos Channel.

Here, as in the program of the earlier launching at Long Beach, U. S. Maritime Commissioner Captain Edward Macauley was the principal speaker present—President Roosevelt, of course, taking precedence by transcription over the radio. Here Captain Macauley's address dwelt largely with the importance of the "Liberty Ships":

"We are able to celebrate today our arrival at a milestone on the road to national security. It is no broad highway of rosy dreams, but a hard rough road. It is the road the American people must travel, because there is no easy way out of the difficulties that

Mrs. Sheridan Downey, wife of the Jr. U. S. Senator from California, sponsor for the John C. Fremont.

Steel Artisan and Mrs. W. A. Ross produce a bubble shower beset the world today. And as I look about me at this evidence of what we can do, I know that no road is too difficult. Let us have faith in ourselves, in what we stand for, in our capacity to work together for the common good, and we shall preserve the blessings of democracy and freedom and plenty for our children and our children's children."

Mrs. S. Downey, wife of California's junior Senator, christened the hull with the name of one of California's most intrepid and most beloved pioneers — John C. Fremont. Promptly at 2:30 p.m., the ship glided into the water and became the first Pacific Coast "Liberty Ship".

John C. Fremont, for whom the vessel is named, came to California first in 1842 and again in 1843. In 1845 he made a third journey of exploration. War with Mexico was imminent and Fremont actively urged the American settlers in California to throw off the yoke of Mexico and form an independent state. He served with the small American Army that made this possible. He was civil Governor of the state for a short term, and afterwards one of the first two senators at Washington from the state of California. He was the first nominee of the Republican Party for President of the United States, running against James Buchanan, but was defeated 174 to 114 in the Electoral College votes. He died in 1890.

Launching endwise in the narrow Cerritos Channel makes quite a problem for the technicians at California Shipbuilding Corporation, or Calship as they prefer to call themselves. There is a scant 1200 feet clearance between the foot of the shipways and the opposite bank. The declivity of the ways, the weight of the hull and the sliding way structure, the coefficient of friction of the grease and the pull of the drag chains must all be figured to a nicety and synchronized for a hull travel before complete stop of not more than 960 feet.

It was calculated that approximately 50 tons of chain drag would be needed on each side of the ship. To make this drag more effective, troughs were built on the floor of the slip way on both sides and partially filled with dirt. The chains dragging through this dirt are more effective than when sliding on the wood floor. Another means of braking the ship was the fastening of broad masks abreast the stern post so as to give a much greater resistance to movement through the water. With all this, the hull of John C. Fremont stopped at a little over 900 feet travel.

Short addresses were made by John A. McCone, vice president and general manager of Calship; Culbert L. Olson, Governor, State of California, and Mr. S. D. Bechtel, president of Calship. Music was contributed by the Long Beach Municipal Band. However, at a launching, the ship is the thing; so, as we already have her afloat, we will jump up to Portland, Oregon, to launch another of the same type.

Star of Oregon

The yard of the Oregon Shipbuilding Corporation on the Willamette River at Portland was festively arrayed in bunting as they came to the launching of their first ship on "Liberty Fleet Day."

All the principal civil dignitaries of the State of Oregon and of the City of Portland were present in force. Mrs. Charles A. Sprague, wife of the Governor of the state, acted as sponsor.

The hull launched was the first of 43 of the EC-2 type that will be running off the ways, one every 10 days or so. Of principal interest, aside from the fact of first launching in the yard, is the romance and significance attached to the name of Star of Oregon in the pioneer history of this region and the part which the original ship Star of Oregon played in maintaining the prosperity and security of the first American settlers in the Willamette Valley, as shown by the following interesting story, the data for which was taken from Dryden's Marine History of the Pacific Northwest.

On May 19, 1841, there was launched from primitive shipbuilding ways on Swan Island, Willamette River, Oregon, the wooden two-masted schooner Star of Oregon.

Exactly 100 years thereafter, on May 19, 1941, a steel keel was laid on the banks of the Willamette and the hull that was erected thereon was launched on September 27, and christened Star of Oregon.

This latter vessel is one of several hundred building in the United States shipyards to meet the present international emergency. It is interesting to note that the original Star of Oregon was built also to meet an emergency.

In 1841, the American settlers in the Willamette valley were facing somewhat of a crisis. They needed stock (cattle, sheep and horses). The Hudson's Bay Company, and one or two others, owned all stock and refused to part with any of it. The settlers got together and determined to build a schooner, sail her down to California, sell her, buy stock with the money and drive that stock overland back to Oregon. This was the first American ship built in the Pacific Northwest.

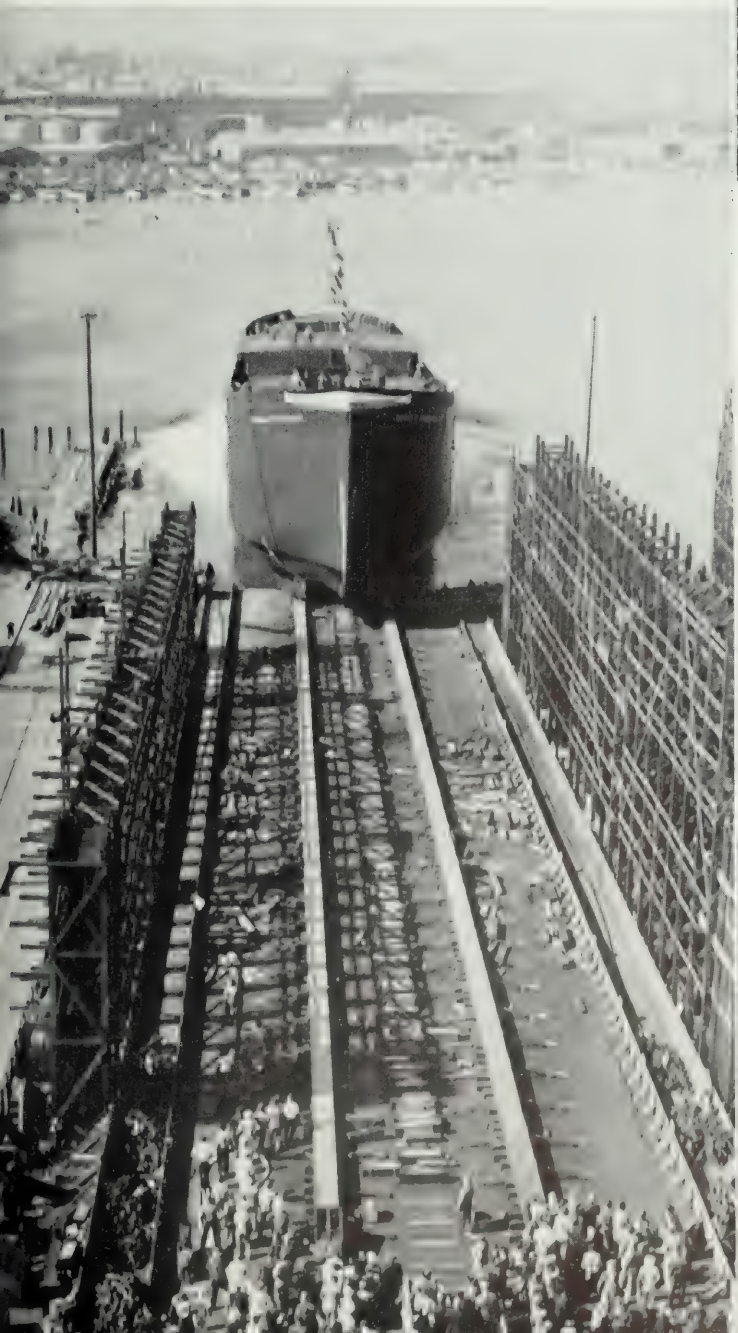
One of the settlers, Joseph Gale, had some experience as a seaman and

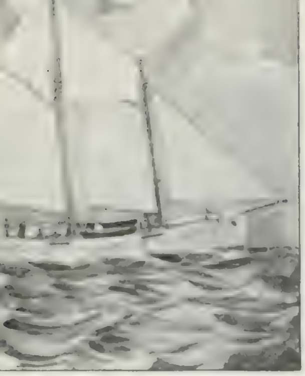
a shipwright. Star of Oregon was built under his supervision and with some help from Captain George Wilkes of the U. S. Navy, then at Fort Vancouver on his voyage of exploration 'round the world. Captain Gale with a crew of four men and a boy (all green hands) worked the schooner down the coast successfully and swung through the Golden Gate on September 17.

The Star of Oregon was sold to good advantage. Captain Gale and his crew preached the gospel of Oregon incessantly through the winter to such effect that when spring came they started north with 42 men driving 1250 head of cattle, 600 horses and mules, and nearly 3000 sheep. The trek took 75 days, but they arrived

Above: Part of the crowd of 20,000 that witnessed launching of John C. Fremont

At left and below: Sequence view of launching





Original schooner Star of Oregon, and below, her sister just leaving the ways. (Photo by Vincent)

at Willamette Falls with very little loss of stock.

Thus, the original Star of Oregon made good and met the emergency of Oregon a century ago. May the present Star of Oregon and her sisters in the "Liberty Fleet" be equally successful in the present emergency.

Two British Ships Put Over

Two of the emergency type British vessels were launched at the Todd California Shipbuilding Corporation plant, Richmond, California—one at 3 p.m., the other at 5:15 p.m. These two launchings were each accompanied by an elaborate program. The yard gates were open to the public and a huge crowd attended the ceremonies.

Fred D. Parr, introduced by C. P. Bedford, general manager Todd-California Shipbuilding Corporation, acted as master of ceremonies for both launchings. At 2 p.m. music by the Richmond High School Band opened the program. This was followed by the singing of "*America,*" in which the audience was led by Armand Girard.

After the invocation by Comdr. H. M. Peterson, Chaplain of the 12th Naval District, the sponsor, Mrs. F. C. Cocks, and her matron of honor, Mrs. E. W. Hannay, were introduced and a presentation of flowers made by Sherrod Davis, president of the Richmond High School Honor Society.

Then came a vocal solo by Mr. Girard, followed with four short snappy addresses by:

Hon. W. W. Scott, Mayor of the City of Richmond;

Hon. Godfrey A. Fisher, British Consul General at San Francisco;

Mr. P. M. Sanford, President, Richmond Chamber of Commerce; and

Rear Admiral John W. Greenslade, Commandant, 12th Naval District.

Mrs. F. C. Cocks, the sponsor, is the wife of the special representative of Lloyds Register at the Todd-California yard; Mrs. E. W. Hannay, her matron of honor, is the wife of the well-known Pacific Coast shipbuilder who superintends the erection of these ships. At this point on the program these ladies and the ship took charge. Mrs. Cocks swung the bottle with a strong right arm and pronounced the formula "I christen thee Ocean Voice," with a cultivated British accent. The hull slid swiftly down her greased ways and Todd-California's third vessel was afloat and being shunted into the outfitting dock.

To fill the interval between the launchings and keep the crowd interested, the 13th Infantry, U. S. Army, Col. Chas. H. Corlett commanding, put on an exhibit of infantry arms and transportation.

Then, at 3:50 p.m., a program of music and oratory was presented, featuring Armand Girard, vocal soloist, and the transcribed radio address of President Roosevelt.

A group of notables were introduced to make a few appropriate remarks. These included:

Brig. Gen. Edward A. Stockton, Jr., U. S. Army;

W. T. Helms, superintendent, Richmond Public Schools;

J. J. Walsh, West Coast representative, British Ministry of War Transport;

E. C. Mausshardt, Pacific Coast Director of Operation, U. S. Maritime Commission;

Hon. T. H. De Lap, state senator; and

Henry J. Kaiser, president, Todd-California Shipbuilding Corporation.

In his terse and pungent style, E. C. Mausshardt brought out the following very interesting and significant figures for the immediate future of American shipbuilding. Said he:

"Between 130 and 134 new vessels will be completed this year on the basis of current reports from all the yards. This means that a 25 per cent speedup in production has occurred. If stoppages, due to priorities or other factors, do not hold us back, 90 vessels

Ocean Voice afloat, and (at left) her sponsor, Mrs. F. C. Cocks, attended by matron of honor, Mrs. E. W. Hannay

of 1,000,000 deadweight tons will be delivered in the first three months of 1942; 146 vessels of 1,400,000 deadweight tons will be delivered in the second three months of 1942; 154 vessels of approximately 1,646,000 deadweight tons will be delivered in the third quarter and 184 vessels of close to 2,000,000 deadweight tons will be delivered in the fourth quarter. In the first quarter of 1943, 220 ships aggregating 2,270,000 deadweight tons will be placed in operation. Thus, in the first quarter of 1942, the American shipbuilding industry will deliver more new ships than were produced in the United States during any previous year since the first World War, with the exception of 1941, and more ships than were delivered in the whole of 1917, when we were at war.

With this optimistic keynote ringing in their ears, the sponsor, Mrs. C. P. Bedford, wife of the general manager of Todd-California Shipbuilding Corporation, and her maid of honor, Miss Elizabeth Cocks, were ready and eager for their part of the ceremony, and the good ship was trembling with eagerness to get away for useful service.

So at 5:15, with the evening sun high-lighting the Golden Gate and throwing dark purple shadows down the slopes of Tamalpais, Mrs. Bedford smashed the champagne bottle over the nose of the seventh Pacific Coast "Liberty Fleet Day" hull and christened her Ocean Venture.

Thus closed "the end of a perfect day" with a perfect score for Pacific Coast shipbuilders.

Ocean Venture on her way, and her sponsor, Mrs. C. R. Bedford, with her maid of honor, Elizabeth Cocks.

"In an Emergency

Richmond Shipbuilding Lays Keels for that are to be

A Bay Cities truck crane moves incoming plates from flatcar to trailer

During the month of April of this year, the Richmond Shipbuilding Corporation was established and began negotiating with the U. S. Maritime Commission for a contract to build and operate a shipyard for the erection and outfitting of Emergency type (now known as "Liberty" type) hulls. The site proposed was a tract of mud flats and marsh land on the inner harbor of Richmond, California.

Early in April, the Maritime Commission contracted with the Richmond firm to build a six-way shipyard, complete with all necessary facilities for the construction of the "Liberty" type cargo steamer.

Work was started on April 10. At first the crews worked on a five-day-week basis, but during July and August some of the crews worked on Saturdays. One of the first big jobs was to prepare the ground for and to procure and distribute over 215,000 cubic yards of rock fill. A nearby hill was found to be of suitable rock material and was blasted out and moved over to the site. On May 1, the yard was allocated 24 of the "Liberty" type ships on an adjustable fixed-fee basis.

On September 17 the keels for the first three of these vessels were laid. The date is very significant under the circumstances. At the end of that document which for every American citizen was intended to "establish justice, insure domestic tranquality, provide for the common defense, promote the general welfare, and secure the blessings of liberty," there appear these words: "Done in convention by the unanimous consent of the states present the seventeenth day of September in the year of our Lord one thousand seven hundred and eighty-seven and of the independence of the United States, the twelfth: In witness whereof we have hereunto subscribed our names."

"Geo. Washington,
Presidt. and Deputy from Virginia."

So here in the year of our Lord 1941, and of the independence of the United States, the one hundred and sixty-sixth, on that same Seventeenth day of September, U. S. Constitution Day, the Richmond Shipbuilding Corporation is rightly proud to have laid the keels for three fine ships whose sole purpose is to help "provide for the common defense" and to guard the future of the American nation from any loss or diminution of those rights and blessings to which under the con-

Three keels are laid Sept. 17 for emergency type steamers, to be delivered in less than four months

There's No Schedule"

Corporation three EC-2 Steamers delivered before New Year

A plate is laid for the first keel

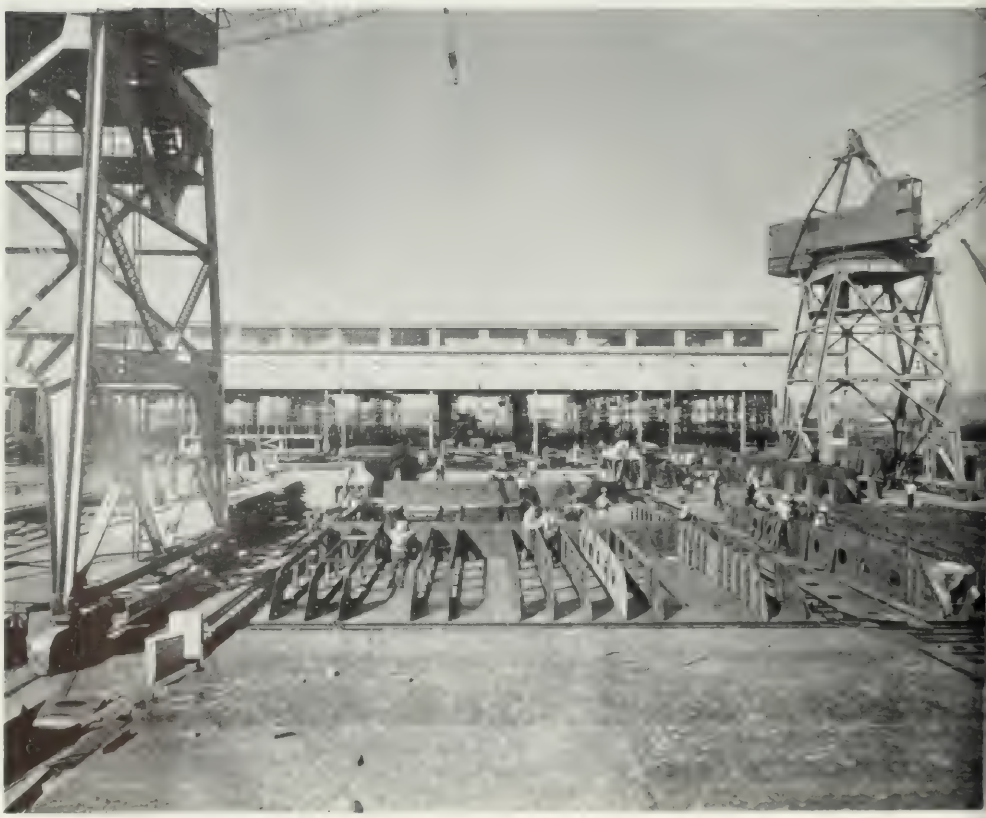
SHIPBUILDING EXPERTS OBSERVE KEEL LAYINGS

This group includes, left to right: Russel J. Carroll, Chief Construction Engineer, U. S. M. C.; E. W. Hannay, general supt., Richmond Shipbuilding Corp.; Clay P. Bedford, general manager, Richmond Shipbuilding Corp.; Maurice Nicholls, consulting engineer, Richmond S. B. Corp.; and C. H. Day, personnel manager, Richmond S. B. Corp.

●

At right, we have, left to right: O.H. McCoon, construction supt.; Michael Goulle, building supt.; Bedford Day; Russel J. Carroll; E. W. Hannay; Clay P. Bedford; Francis J. Gilbride, president, Robins Dry Dock & Repair Co., Brooklyn, N.Y.; Maurice Nicholls and D. C. Peacock, Jr.

Russel J. Carroll, Chief Construction Engineer for the U. S. M. C. at Richmond Shipbuilding Corporation, is responsible for the building of this fine new shipyard and for its maintenance and repair. He is shown here examining a model of the emergency type cargo steamer, 24 of which are to be built at the Richmond yard. Mr. Carroll is absorbed in his job, likes husky Havanas, and loves his inseparable pal, Irish Belle, the Boston Bull terrier (insert).



In planning a modern shipbuilding plant, perhaps the most important feature is the provision of ample space for fabrication of hull assemblies by welding. In the Richmond yard, as shown here, a very large area between the head of the ways and the plate shop is fitted with welding racks, so that machine fabricated shapes and plates move from the plate shop straight through the welded assemblies, and these assemblies in turn straight through to their place in the hull on the ways.

stitution all the United States citizens are entitled.

Some thousands of tons of steel had already been fabricated for the erection of these hulls, and their launching and delivery dates are now estimated for early November and late December, more than three months ahead of contract schedule dates.

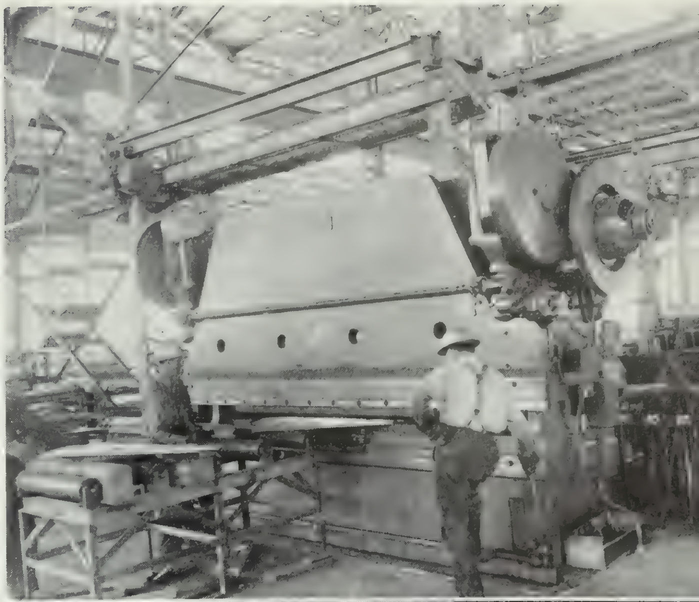
As of the date of these keel layings, the plant was 89 per cent complete. Seventy-eight per cent of the yard had been completed in the 75 days immediately preceding the keel laying date. Due to this fine progress, the Maritime Commission has allotted to the Richmond Shipbuilding Corporation a contract for additional construction at this site involving three more shipbuilding ways and the necessary additional facilities, an increase of approximately 50 per cent over the original contract.

The building of the present yard involved the hydraulic dredging of approximately 1,500,000 cubic yards of material; the driving of approximately 12,000 piles for foundations of ship and crane ways, and piers; and the driving of 3000 piles for the outfitting dock, which is 2000 feet in length of which 1350 feet is available for ships alongside.

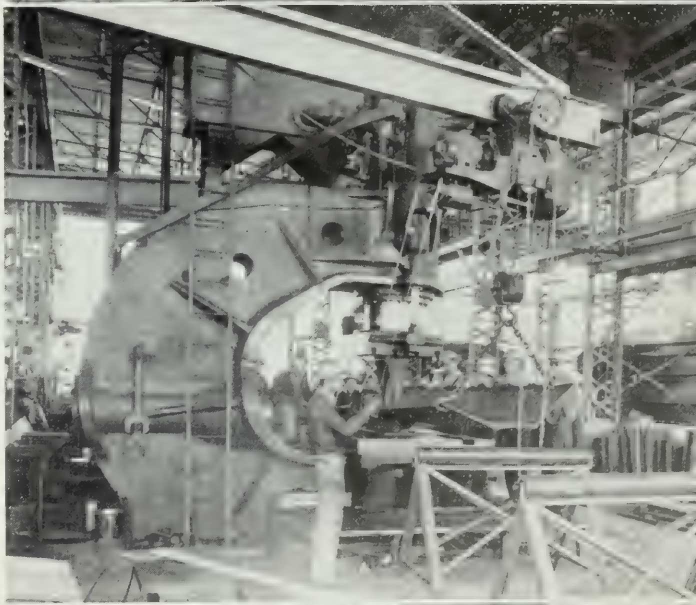
This yard is so laid out that the materials flow naturally from the storage racks through the fabrication shops to the fabricated material racks, and over the welding assembly floors to the shipbuilding ways. This movement is facilitated by 15 gantry cranes, ranging in capacity from 15 to 50 tons. Four miles of standard gage railway track were laid to connect with the carriers serving the district and to enable spotting of cars throughout the yard. Ample room is provided in storage racks, plate shop and welding assembly racks so that there is no interference with the orderly progression of the work.

There are approximately 2200 men on the payroll at the present time. When the 50 per cent increase in facilities is completed and all the ways are busy, the normal working crew will average approximately 8000 men.

Most of the men at this yard are what might be termed "green hands," so far as shipbuilding is concerned. They have had to be trained in many ways, and it is greatly to the credit of the leadermen and the superintendents



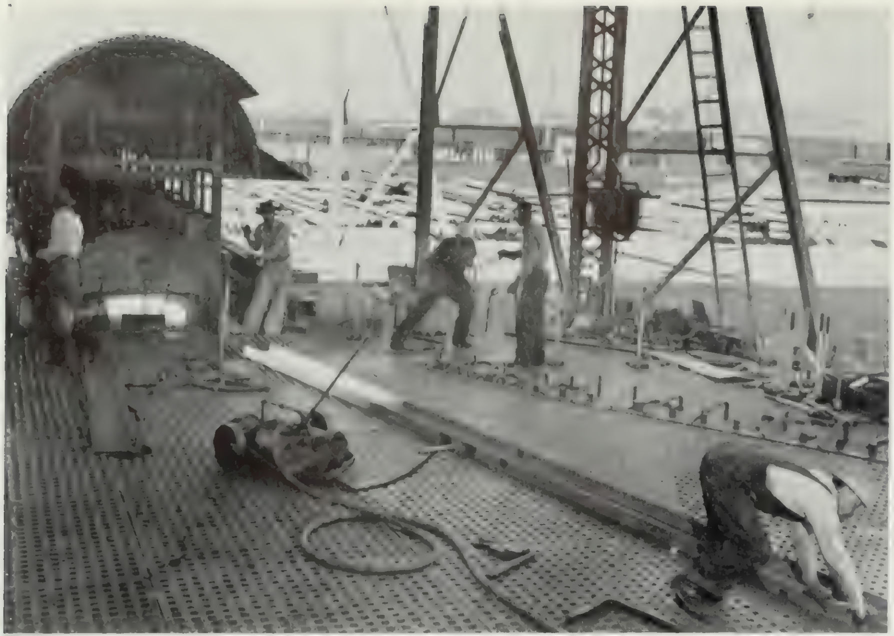
In the plate shop a Cincinnati press - brake rapidly forms awkward shape.



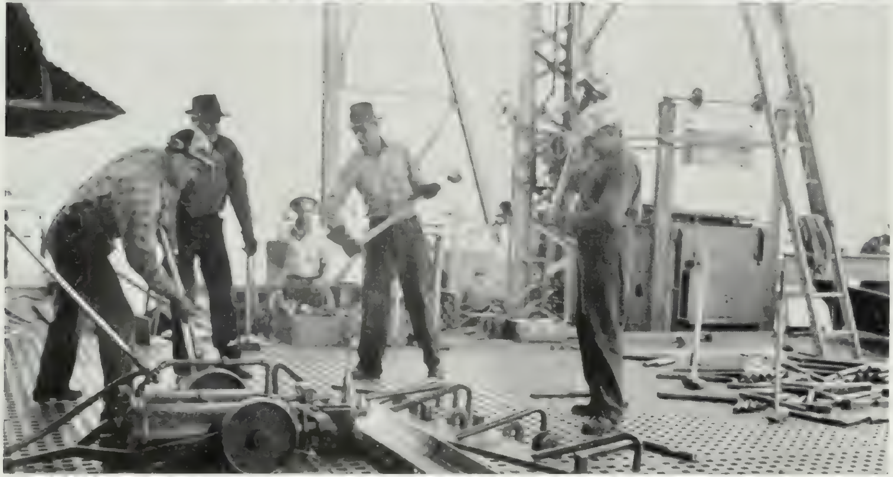
This Southwark hydraulic press is forming sections of the stem.

Most important in a modern shipyard is ample provision for welding and flame cutting. Here we show a small section of the welding floors at the head of one way.

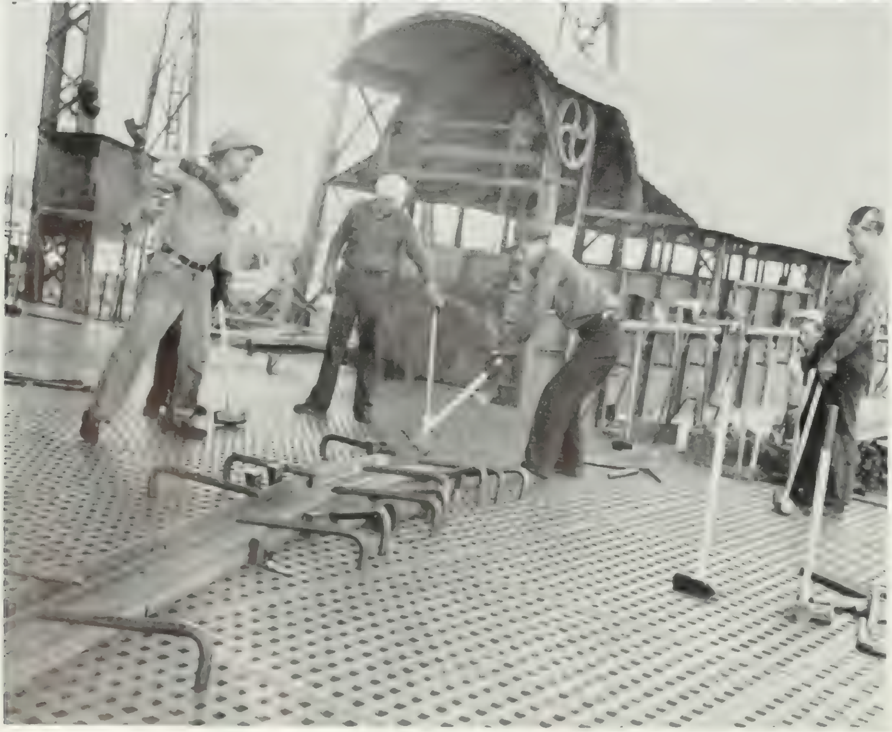
The Bending Slab



A steel channel bar for one of the forward starboard frames is drawn out of the furnace.



Spotted correctly, the bar is bent against the template by a pneumatic bulldozer. The slab men stand ready with heavy sledges to beat down any buckling in the frame.



Here the sledges are in action, evening out any irregularities left by the bulldozer, so that the frame will have a fair line.

that with inexperienced labor they have been able to show such a fine record.

The excellent progress record of this yard is due to the efficient organization and the effectiveness and energy with which the entire personnel have worked to carry out the plans of the executives.

Executives principally responsible for the record are:

Russel J. Carroll, plant engineer for the U. S. Maritime Commission. Mr. Carroll has a long record of successful construction in shipyards and industrial plants, dating back to and before the time, during the last war, when he had charge of the building of the great shipyard at Hog Island. His intimate knowledge of plant planning and construction problems and his tact in handling men have had a major share in making this record possible.

Clay P. Bedford, General Manager, Richmond Shipbuilding Corporation. Mr. Bedford is well known on the Pacific Coast as a very successful construction engineer. He has been construction superintendent for Henry J. Kaiser since 1925. He brings to this shipyard the spirit that has conquered the practical difficulties of bridge and dam construction in Western United States, tempered by the wisdom gained from that experience.

Dan C. Peacock Jr., General Superintendent, Richmond Shipbuilding Corporation. Mr. Peacock, a graduate engineer of the University of Washington, has had 10 years of active construction work on the Pacific Coast.

Maurice Nicholls, Consulting Engineer, Richmond Shipbuilding Corporation. Mr. Nicholls is well known in shipbuilding circles as a competent naval architect and marine engineer. He served an apprenticeship at Cramps yard, Philadelphia, graduated at Michigan University and has served in the principal shipyards of the Atlantic seaboard. His training and experience is of great value to this new shipbuilding yard.

Edwin W. Hannay is yard superintendent in charge of ship construction. An old time Pacific Coast shipbuilder, Mr. Hannay has made some excellent ship construction records on the West Coast.

The Ship Inspection Division of the U. S. Maritime Commission is represented by William Russell and Charles Stewart, respectively Principal Machinery Inspector and Principal Hull Inspector. When the inspection staff is fully developed, there will be approximately 15 assistant inspectors.

Among the group witnessing the triple keel laying on September 17 were:

Francis J. Gilbride, president Robins Dry Dock and Repair Works of the Todd Shipyards Corporation, New York.

Hon. W. W. Scott, Mayor of the City of Richmond.

J. A. McVittie, City Manager of Richmond.

P. N. Sanford, president of the Richmond Chamber of Commerce.

Over 2000 employees witnessed these keel layings.

VIBROMETER DIAGNOSES MECHANICAL JITTERS

In designing new types of machines, engineers often run into serious vibration problems. Like a person with a bad case of jitters, machines are less efficient and wear out more quickly when they vibrate more than they should. Also the vibrations usually cause unnecessary noise.

The Westinghouse Research Laboratories have recently announced a new instrument, analogous to the stethoscope of the physician, which will be very valuable in making quick diagnoses of vibration problems. This instrument will measure all vibrations between 500 and 20,000 per minute. It is called the Vibrometer.

Its essential part is a thin strip of spring steel, called the reed, clamped between two pairs of small steel rollers. During a test, the head of the Vibrometer is held against the "ailing" machine and a knob on one of the rollers is turned to extend or retract the reed and thus tune it to the vibration of the machine.

A scale along the back of the reed then indicates the frequency (vibrations per minute). With this information the engineer can often diagnose the cause of vibration.

If the machine is a motor, for example, and its frequency is 7200 vibrations per minute, the engineer knows immediately that it has some magnetic ailment, for that is just double the frequency of ordinary alternating current. Its elimination would require a change in frame stiffness or a complete redesign of the machine. A frequency corresponding with the rotational speed would mean the machine was unbalanced mechanically. Once the category of ailment is decided, the engineer can start looking for actual causes and prescribe a cure.

For example, the Vibrometer recently saved time and trouble in a search for vibrations in a powerhouse. Electrical instruments on a switchboard in the powerhouse had been wearing out much faster than they should. In beginning a study of the problem, the first thing noticed was vibration in the floor, caused by nearby compressors for a refrigeration system. The obvious guess was that these vibrations were wearing out the instruments.

But the Vibrometer told another story as it was held against the switchboard and "tuned in" the various frequencies. The vibrations from the compressors showed up all right, being about 720 per minute. But there were also found faint vibrations at 3600 and 7200 a minute which had been unsuspected. These were caused by electric motors, generators and transformers in the power station itself.

The Bethlehem

San Francisco's Famous Yard Delivers Five to the Maritime Commission

The pictures illustrating this article were all taken on board the steamer Alcoa Patriot by PACIFIC MARINE REVIEW photographer with the permission of the San Francisco representatives of the Alcoa Steamship Company, Inc. The views were selected to demonstrate the excellent workmanship displayed in this vessel by the San Francisco Works of the Union Plant of the Shipbuilding Division of the Bethlehem Shipbuilding Co., Ltd. and by the vendors supplying them with machinery and equipment.

On September 18, 1939, the Union Plant contracted with the Maritime Commission to build five of these steamers and to deliver the last of the five on November 21, 1941. The last ship was delivered September 10, approximately 70 days ahead of schedule. These ships are Santa Cruz, allocated to the Grace Line; and Alcoa Pioneer, Alcoa Pilgrim, Alcoa Patriot and Alcoa Puritan, all allocated to Alcoa Steamship Company, Inc. All are sisters and all demonstrate that Union Plant of Bethlehem is living up to its tradition of building good ships and good power plants.

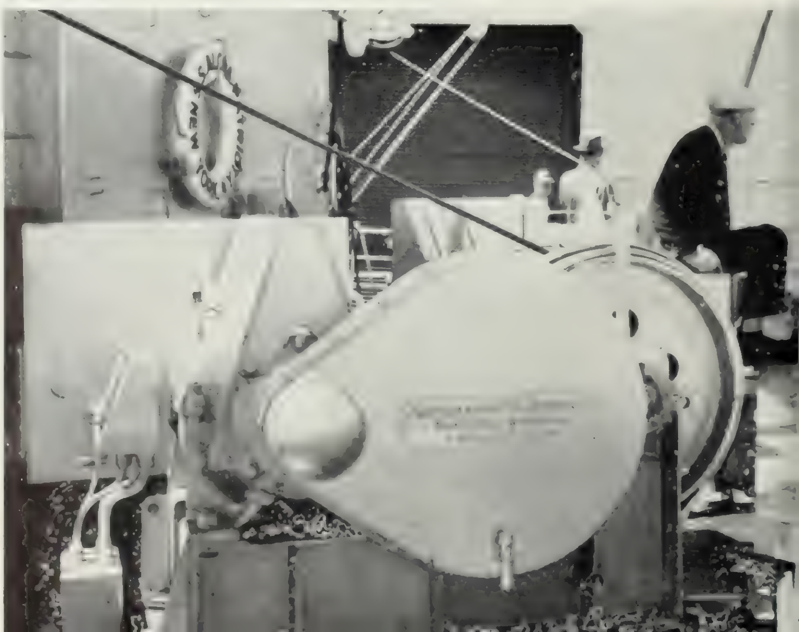
The C-1-B cargo steamer has the characteristics shown in the table herewith.

These C-1 vessels are subdivided into eight watertight compartments by seven bulkheads, which extend watertight to the main deck. From the bow, aft, these compartments are: the fore peak running aft 22 feet from the forward perpendicular and containing bosun's stores, the chain locker, and a ballast tank; No. 1 hold extending aft 67′ 6″ from the forepeak bulkhead; No. 2 hold extending aft 67′ 6″ from the after bulkhead of hold No. 1; No. 3 hold extending 54′ aft from the after bulkhead of hold No. 2; the machinery space extending aft 45′ from the after bulkhead of the No. 3 hold; No. 4 hold extending aft 49′ 6″ from the after bulkhead of the machinery space; No. 5 hold extending aft 67′ 6″ from the after bulkhead of No. 4 hold; and the after peak extending 22′ aft from after bulkhead of No. 5 hold to the after perpendicular and containing the steering gear room and the after ballast tank.

General Characteristics

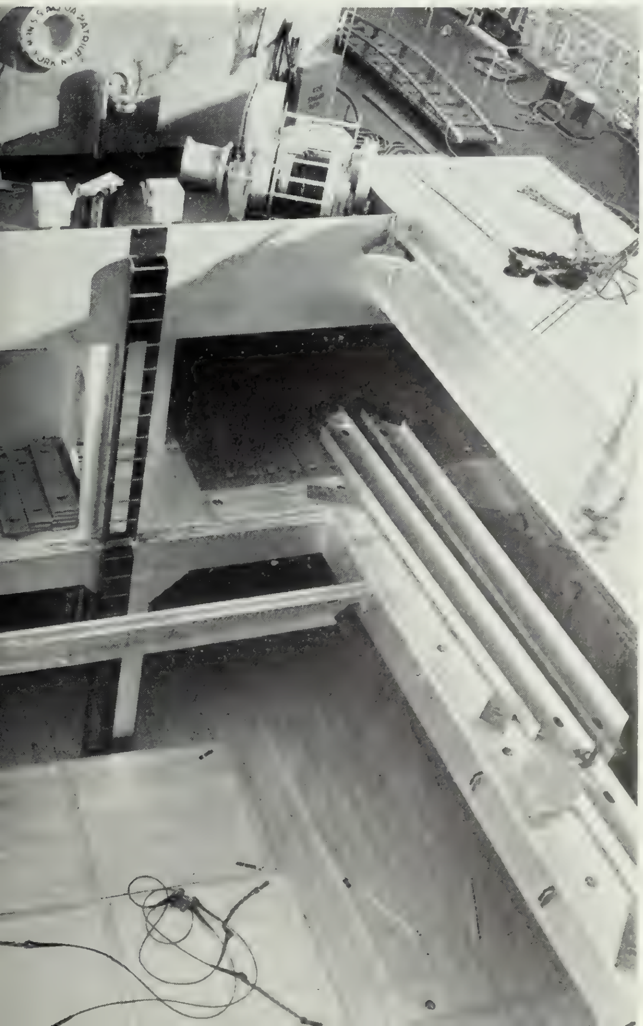
C-1-B Cargo Steamers

Length O. A.	417′ 9″
Length B. P.	395′ 0″
Beam molded	60′ 0″
Depth molded M. D.	37′ 6″
Draft loaded	27′ 6″
Deck height	9′ 6″
Gross measure	6,863 tons
Net measure	4,007 tons
Propulsion power	4,000 shp
Sustained sea speed	14 knots
Built weight	3,780 tons
Fuel oil	1,301 tons
Fresh water	415 tons
Crew and stores	30 tons
Cargo	7,349 tons
Total deadweight	9,095 tons
Displacement loaded	12,875 tons
Normal crew	43
Passenger capacity	8



C-1-B Fast Cargo Steamers

w are shown: at left, one of the 16 cargo winches serv-
the fine holds of Alcoa Patriot; at right, a very striking
view looking down into one of her capacious holds.



Fred Petsolp, Bethlehem trial trip fireman (at board), and E. C. Gregory, Bethlehem guarantee engineer, adjust the combustion control to give a clean stack (opposite).

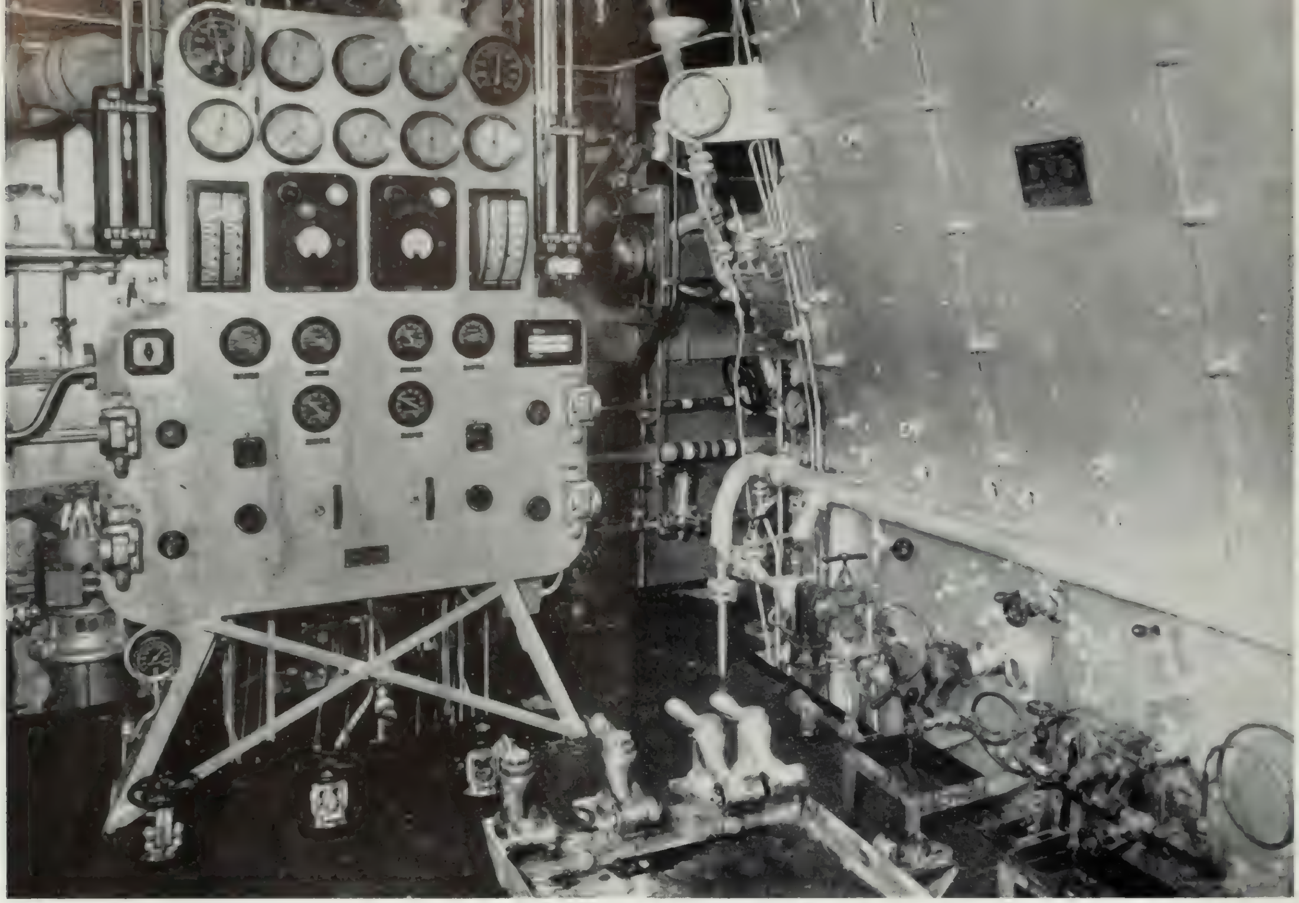
Deck Machinery

As will be noted in the broadside picture of the ship, she has three cargo masts and four king posts. Each cargo mast has four booms stepped at its base, and each king post has one boom. These 16 winches are by the American Hoist & Derrick Co., driven by Westinghouse motors, and geared to handle three- and five-ton loads with satisfactory dispatch. The blocks and fairleaders for the cargo-handling gear are all by Madesco. This cargo-handling arrangement is figured to handle general cargo on a cycle considerably faster than that approved by the American longshore labor rules, so it has ample capacity.

Lidgerwood supplied the windlass and the steering gear. Driven by an Electro-Dynamic 50-hp motor through suitable gearing, this windlass raises two anchors and 30 fathoms of chain on each anchor (a combined weight of 31,600 pounds) at the speed of 30 feet per minute. Baldt Die-Lock anchor chain is used and Baldt stockless anchors. The steering gear is of the electro hydraulic type, operated by either hydraulic or electric telemotor system from the pilot house. The motors were supplied by the Electro Dynamic Co. and the hydraulic pumps are the Northern rotary type.

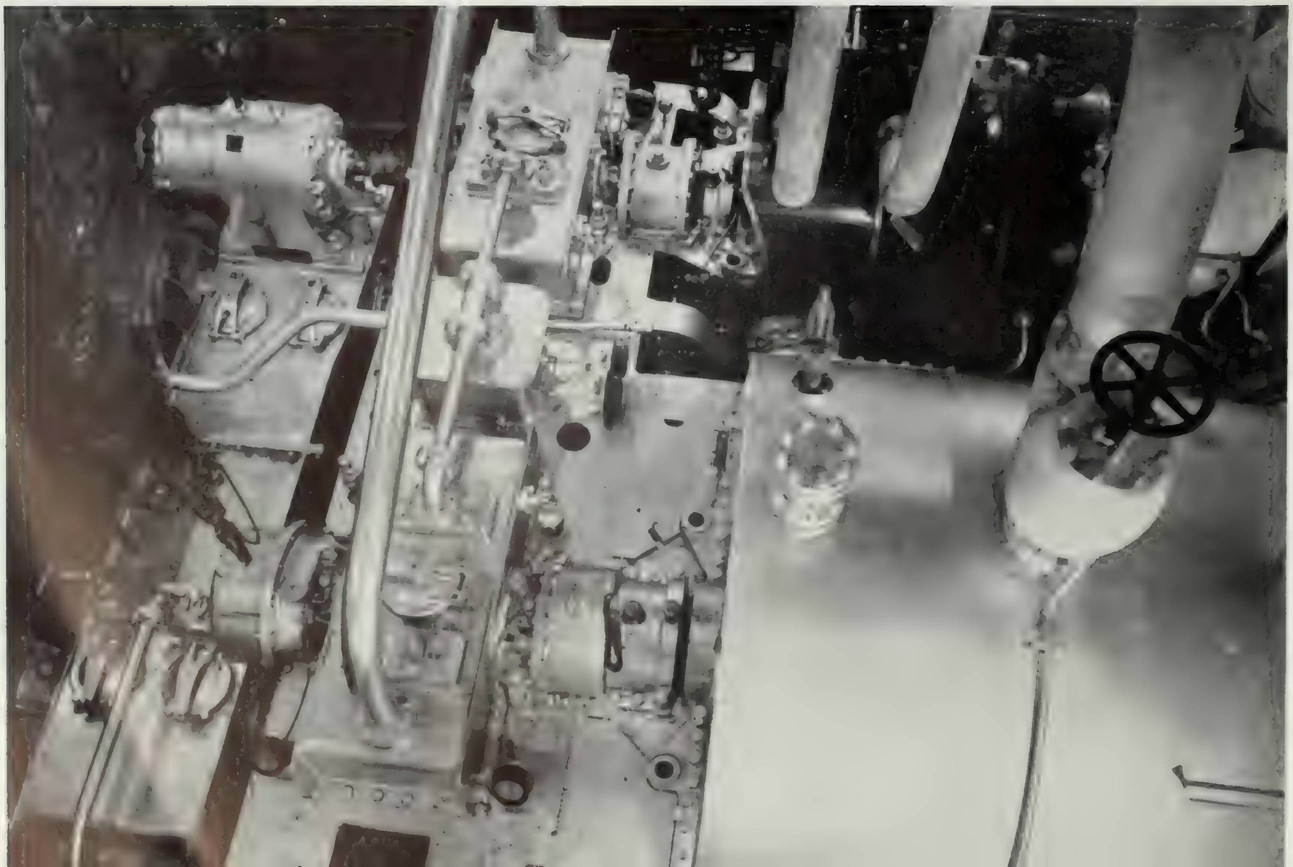
A large warping capstan installed on the main deck aft was furnished by the Lambert National Hoist-Derrick, Division of the McKiernan Terry Corporation.

Boats and boat winches are by the Welin Davit and Boat Corporation



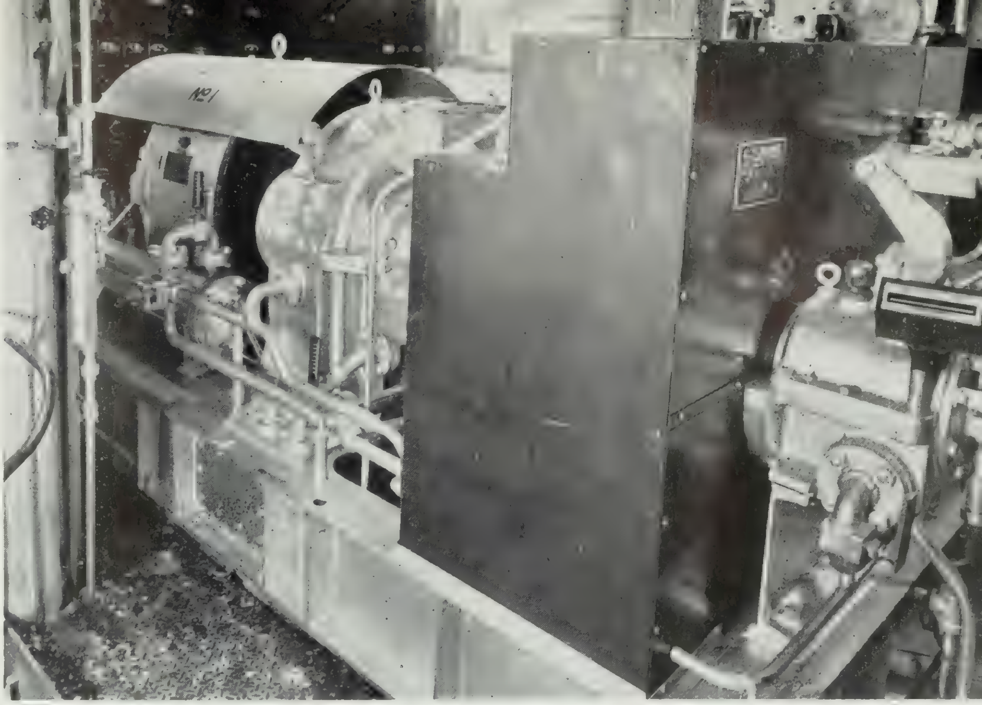
On Alcoa Patriot and her sisters, steam is generated in Babcock & Wilcox boilers under the supervision of Hagan Combustion Control, as shown above

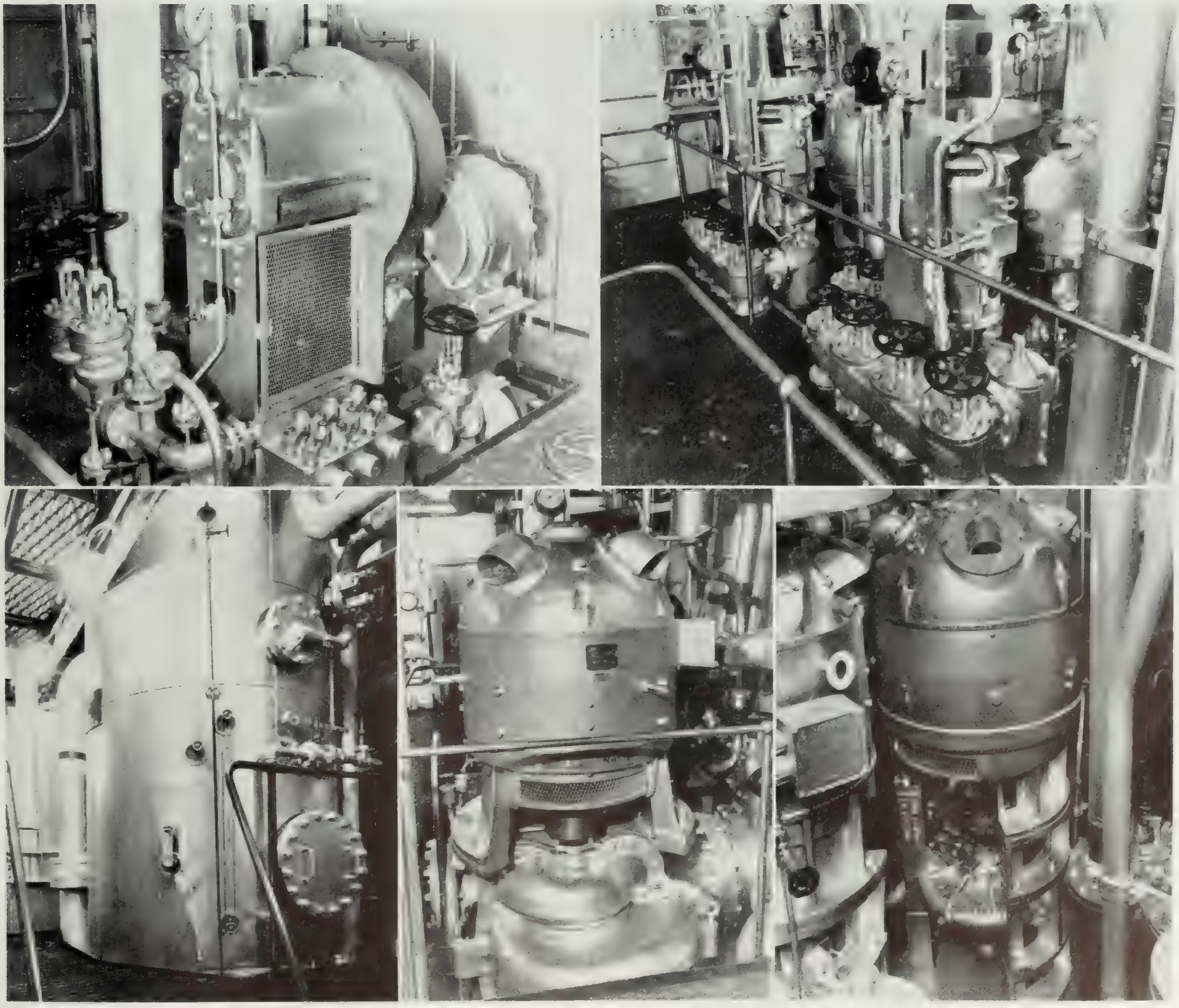
Below, we have an unusual shot looking down on the Bethlehem cross-compound steam turbines and their Falk double-reduction gearing

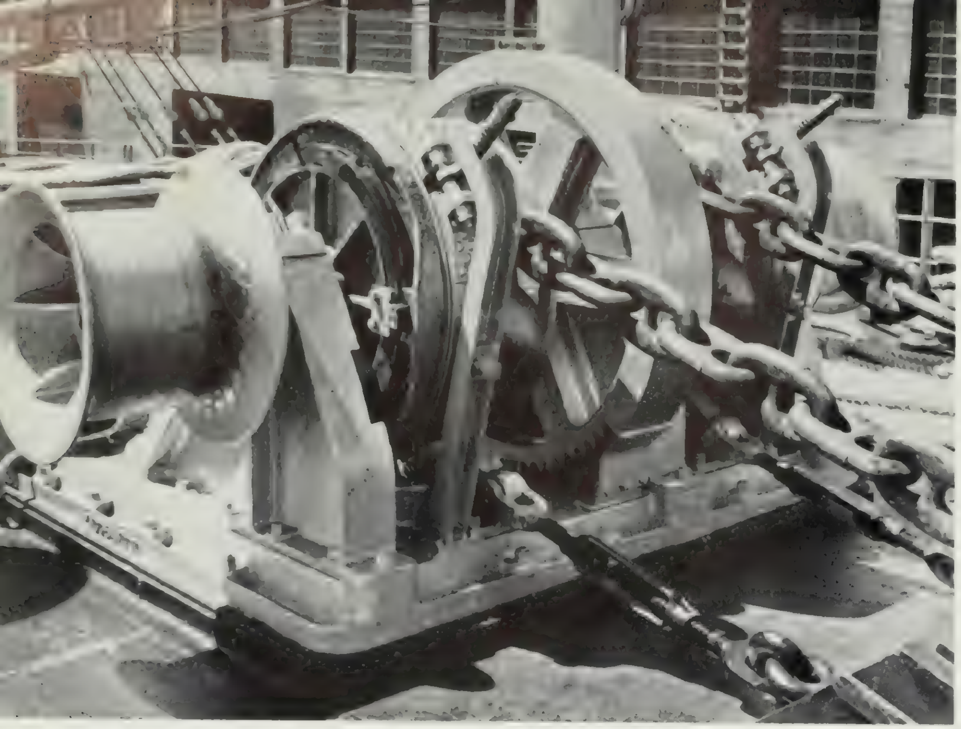


At right, one of the two Allis-Chalmers generating sets on the dynamo flat.

Below, upper row, left to right: the Worthington main feed pump; and a group of Buffalo general service pumps. Lower row, left to right: Cochrane deaerating feed water heater; Ingersoll-Rand main circulating pump; a Buffalo centrifugal on general service. Motors are all Electric-Dynamic.







Lidgerwood electric windlass on Alcoa Patriot

and the davits are the Stewart type, furnished by Galbraith and Son, Inc.

Canvas covers for the deck machinery and tarpaulins for the hatches were tailored to suit and furnished by the J. L. Stuart Mfg. Co. of San Francisco.

Propulsion Machinery

Alcoa Patriot and her sisters are propelled by a single screw, driven by cross-compound, double reduction-geared turbines, taking steam from two water tube boilers. Turbines and boilers are installed in the same compartment which occupies 45 feet of the ship's length.

The steam conditions on this plant are 450 psi pressure and 740° F. temperature at the turbine throttle. The normal rating is 4000 shp and the plant has a capacity to supply 4400 shp continuously and 5000 shp for two hours.

Babcox & Wilcox supplied the single-pass type marine water tube boilers, which are equipped with Todd variable capacity oil burners and Sturtevant forced draft fans. Hagan Combustion control is installed and the feed water is conditioned by the Hall System. Fittings include: Reliance "Eye-Hye" water glasses; Ess "Haze Gage;" and Diamond soot blowers. These boilers deliver steam at the superheater outlet with 450 psi pressure and 750° F. temperature. Each unit has a continuous steaming capacity to deliver 18,500 pounds at those conditions.

The main propulsion unit is of the Bethlehem cross-compound type with an impulse reaction, high-pressure turbine, having a two-stage impulse astern element mounted at the exhaust end of the casing. Casings of both turbines are of rigid cast steel construction and have bleeder openings fitted with stop check valves to allow extraction of steam for feed heating and for evaporator and for ship's heating systems. The high-pressure turbine rotor at rated power turns 5500 rpm, and the low pressure 2700 rpm. Each is connected to its pinion through flexible coupling, the low-pressure connection having two such couplings with a quill shaft passing through the pinion shaft to the afterside of the pinion.

Falk supplied the double-reduction gear for these ships. It is of the double-helical type with a Kingsbury type thrust bearing incorporated in the casing.

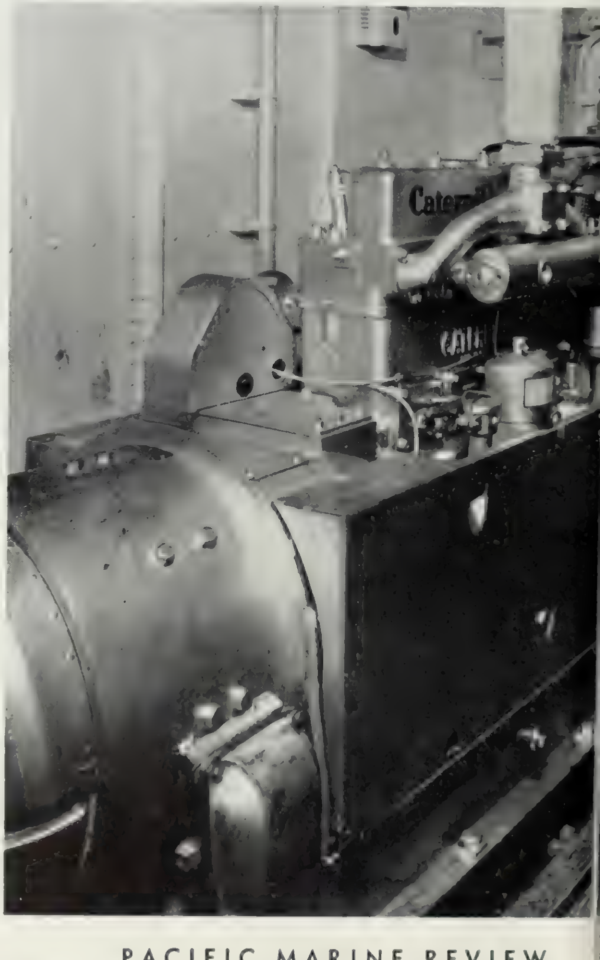
The propeller is a four-bladed solid bronze wheel by Doran.

The turbine casings are bolted rigidly to the gear case at the after end but are mounted for axial flexibility

●

This Caterpillar diesel generating set automatically takes over 20 per cent drop in voltage and provides emergency light and power in any accident. It is located on the weather deck and will function in almost any condition of the ship, short of sinking.

●



at the forward end. The weight of the condenser is taken by two beams, the after ends of which form the sides of the exhaust casing and the forward ends rest on the structural member forming the foundation for the forward ends of the turbines.

Lubrication for the turbine bearings and for the gears is serviced by Quimby pumps, and the oil is kept clean by Gould "Hyroil" purifiers.

All general service pumps in the engine room are by Ingersoll Rand with Electro Dynamic motors.

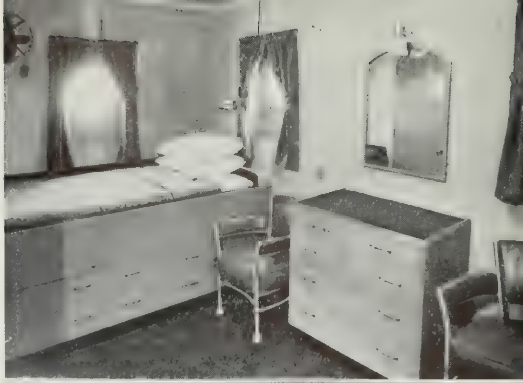
The feed pumps are of the Worthington plunger type driven through spur gears by Electro Dynamic motors. These pumps take their suction from the hot well formed by the large capacity tank of the Cochrane deaerating feed water heater, and deliver the feed water to the boilers through a high-temperature heater.

All of the engine room and deck auxiliaries and all of the cooking and lighting are fitted for electrical operation, and power for this load is generated by two Allis Chalmers turbines taking steam at same conditions as the main turbines, and each driving an Allis Chalmers three-wire, 120/240-volt, 250-kw direct-current generator. The turbines turn 8000 rpm at normal rating and drive through Falk reduction gearing to turn the generators at 1200 rpm. This electric power is distributed through a Westinghouse dead front switchboard.

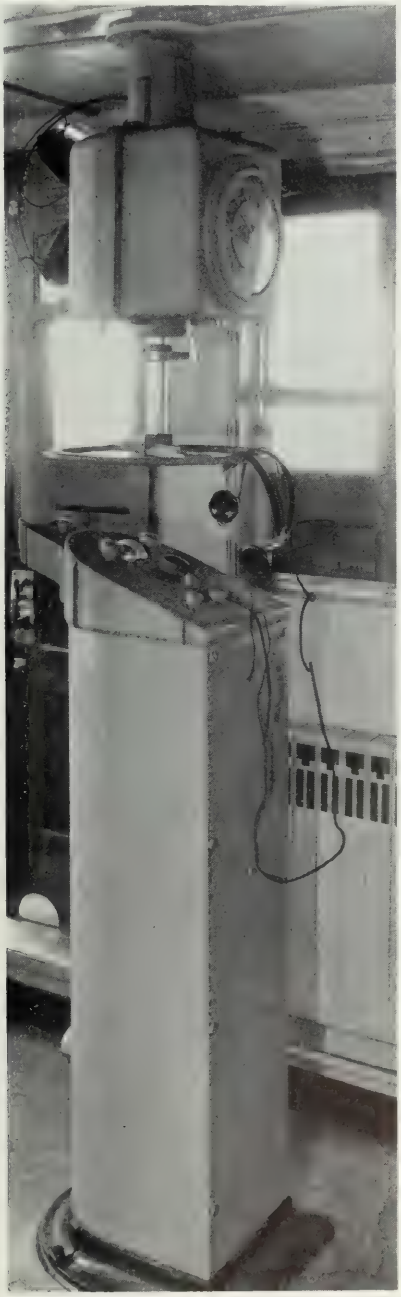
Although the official results of the tests of these power plants have not been made public by the Maritime Commission, unofficial observers, who have attended the trials report that these Bethlehem steamers made a fuel economy record of 0.604 pounds per shaft horsepower on 18,340 Btu fuel.

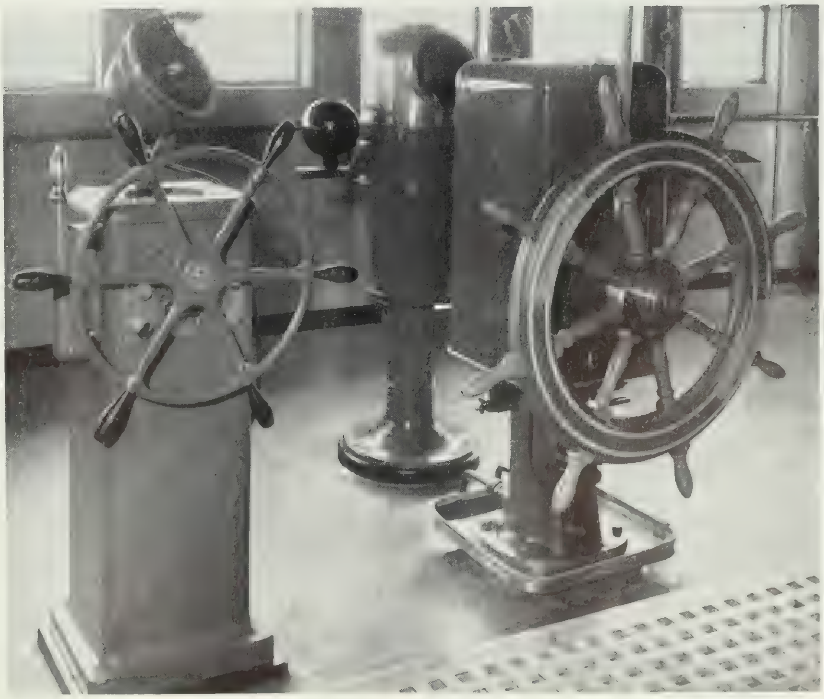
Emergency Generator

For use in any emergency in which the main auxiliary power is not func-



The accommodations for eight passengers on the C-1-B ships are four neat comfortable rooms with bath and a large dining room and lounge.





Navigation equipment aboard Alcoa Patriot includes: at left, the R. M. C. A. radio direction finder; and above, Sperry gyro compass and gyro helmsman

This Lux $C0_2$ foam spreading nozzle protects the fire room

tioning, an emergency generating set is installed on the main deck. This set comprises an efficient economical D-3400, 4 cylinder, 1200 rpm, 25-shp Caterpillar diesel engine directly connected to a 15-kw General Electric generator. It delivers electric energy to a Westinghouse emergency switchboard which is so connected to the main and emergency circuits of the ship that when the voltage on the main turbo-generators drops 20 per cent, the emergency diesel generating set is automatically started by a 12-volt battery and takes over the emergency light and power service. This set works on a fuel consumption of 0.75 pounds of diesel oil per kilowatt hour.

Navigation Equipment

The most modern American navigation equipment is installed in the pilot house. This includes: complete Sperry Gyroscope Company Mark IV master gyro compass and repeaters; Sperry Gyro Pilot; and Sperry Course recorder.

A Fathometer furnished by the Submarine Signal Company gives continuous depth soundings.

The Radiomarine Corporation provided a radio direction finder and the ship's radio communication apparatus.

A Tanner electric sounding wire machine is installed on the bridge.

The Henschel Corporation furnished: tank-level alarms; general alarms; shaft revolution counter; the engine telegraphs; the rudder angle indicator; and the running light telltale board.

Safety

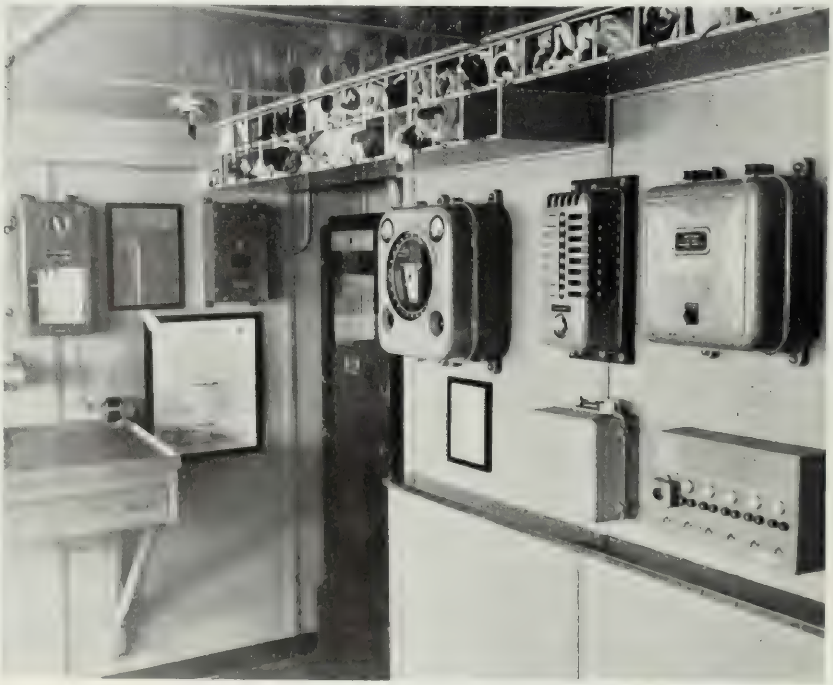
The Maritime Commission ships use very carefully planned installations for fire detection and control. All principal hull spaces are protected by a Lux C-0_2 smothering system and a Rich smoke-detection cabinet furnished by Walter Kidde & Co.

Accommodations

Very spacious and comfortable quarters are provided for eight passengers and for the officers and crew. All quarters are amply equipped with hot and cold fresh-water lavatories, with air-conditioned ventilation, and with electric outlets for every conceivable purpose. Each passenger stateroom has its private bathroom. All the plumbing fixtures and fittings are by Crane.

An all-electric galley and a large well-equipped service pantry provide for the culinary needs of the ships' complement. Prominent in its equipment are: an Edison Electric Appliance range; a Griswold broiler; a Hobart mixer; McGraw toasters; Blickman, Inc., coffee urns; and Auto Egg Timer Co. egg boilers.

American Blower Co. fans, driven by Star motors, serve the ventilating system. This system is arranged in sections and has steam radiators for warming the air when required. The valves of these radiators are operated by Fulton Sylphon Co. temperature controls and so automatically hold any given space at a predetermined comfortable temperature. There is also installed a coldwater tank, over which the ventilating air may be blown to produce a cooling effect when desirable.



A corner of the pilot house, featuring, left to right: the Sperry course recorder, the Lux-Rich smoke detection cabinet; and the Fathometer.

National Defense Featured Tanker Corsicana

At the 1939 meeting of the Society of Naval Architects and Marine Engineers, Mr. N. J. Pluymert, naval architect of the Socony Vacuum Oil Company, read a paper entitled "Modern Tanker Design," wherein he described the evolution of better, faster, more economical bulk oil carriers during the decade just closed. The first paragraph of this paper, as published in Pacific Marine Review for December, 1939, states:

"During the past eight or nine years many improvements have been made in the hull and machinery of tankers which have resulted in material benefits to the shipowner. The increased use of welding in hull construction has brought about a considerable reduction in steel weight, with a consequent increase in the vessel's deadweight. The change from low-pressure steam and diesel to high pressure steam-turbine drive has led to lighter machinery. In conjunction with these changes there has been a trend toward higher speeds and an increase in cargo deadweight."

The tankers reviewed in this paper covered five designs for steam propulsion, all approximating 500 feet overall length, all 37 feet molded depth, all increasing from 28′ 10¾″ to 30′ $\frac{3}{16}$″ draft, and from 65′ 9″ to 68′ molded beam.

It is interesting to note the conservative common-sense approach to the welding problem. The first design entered service in 1930 and was all riveted, using 970,553 rivets; the fifth design entering service in 1939 was largely welded, using 122,055 rivets and 371,168 feet of weld.

Displacement tonnage grew from 20,316 in 1930 to 21,503 in 1939, while light weight of ship was reduced from 5900 to 4953 tons, thus showing a gain in deadweight capacity from 14,416 to 16,550 tons. At the same time, the designed propulsion power was increased from 3600 ihp reciprocating to 4000 shp turbine, with a consequent increase in trial speed at those powers from 12.28 to 13.7 knots. On actual average service the 1930 design gave 11.49 knots on 3084 ihp and consumed 32.95 tons of fuel per 24 hours, while the 1939 ship produced 14 knots sea speed on 4014 shp while burning 27 tons of fuel a day.

Machinery weights were greatly reduced over this series of designs. Propulsion machinery in the 1930 tanker weighed 810 tons and that for the 1939 vessel only 590 tons. Cargo pumps and piping weighed 180 tons on the earlier design and 80 tons on the latter.

Two tankers to the latest design of this series had been built by the Shipbuilding Division of Bethlehem Steel Company on their Frear bracketless longitudinal system with fluted bulkheads. When these two, christened Mobilfuel and Mobilube, showed on trial and in service the results outlined above, they naturally attracted the attention of the U. S. Maritime Commission, who had then a large tanker construction program under contemplation.

Socony-Vacuum had ordered six more of these tankers from Bethlehem. The Maritime Commission proposed to the oil company that national defense features be incorporated in these six tankers on a cost cooperation basis. The U. S. Navy wanted 12,000 shp and 16½ knots sea speed. Socony-Vacuum operation in the Beaumont ship canal made twin screws impractical. On conference, Mr. Pluymert agreed to adaptation of his design to include the national defense features desired and expressed confidence that this could be done without "major sacrifice" of deadweight capacity.

That he made good is amply proved by the recent trials of the Corsicana, first of their six tankers. She exceeded requirements in every particular, easily generating more than 12,000 normal shaft horsepower, and at that power making a speed of better than 17 knots.

The principal characteristics of Corsicana are given herewith in comparison with those of Mobilfuel.

	Corsicana	*Mobilfuel*
Length O. A.	501′ 7½″	501′ 7½″
Beam molded	68′ 0″	68′ 0″
Depth molded	37′ 0″	37′ 0″
Draft S. F.	30′ 1$\frac{11}{16}$″	30′ $\frac{3}{16}$″
Displacement	21,077	21,503 tons
Total deadweight cap.	15,910	16,550 tons
Tank capacity	132,000	133,000 bbls.
Shaft H. P.	12,000	4,000
Speed (designed)	16½ knots	13½ knots

It will be noted from this table of characteristics that in Corisicana, as compared with Mobilfuel, the power of propulsion machinery has been increased by 200 per cent and the speed by 22 per cent, with a sacrifice of less than one per cent in oil capacity.

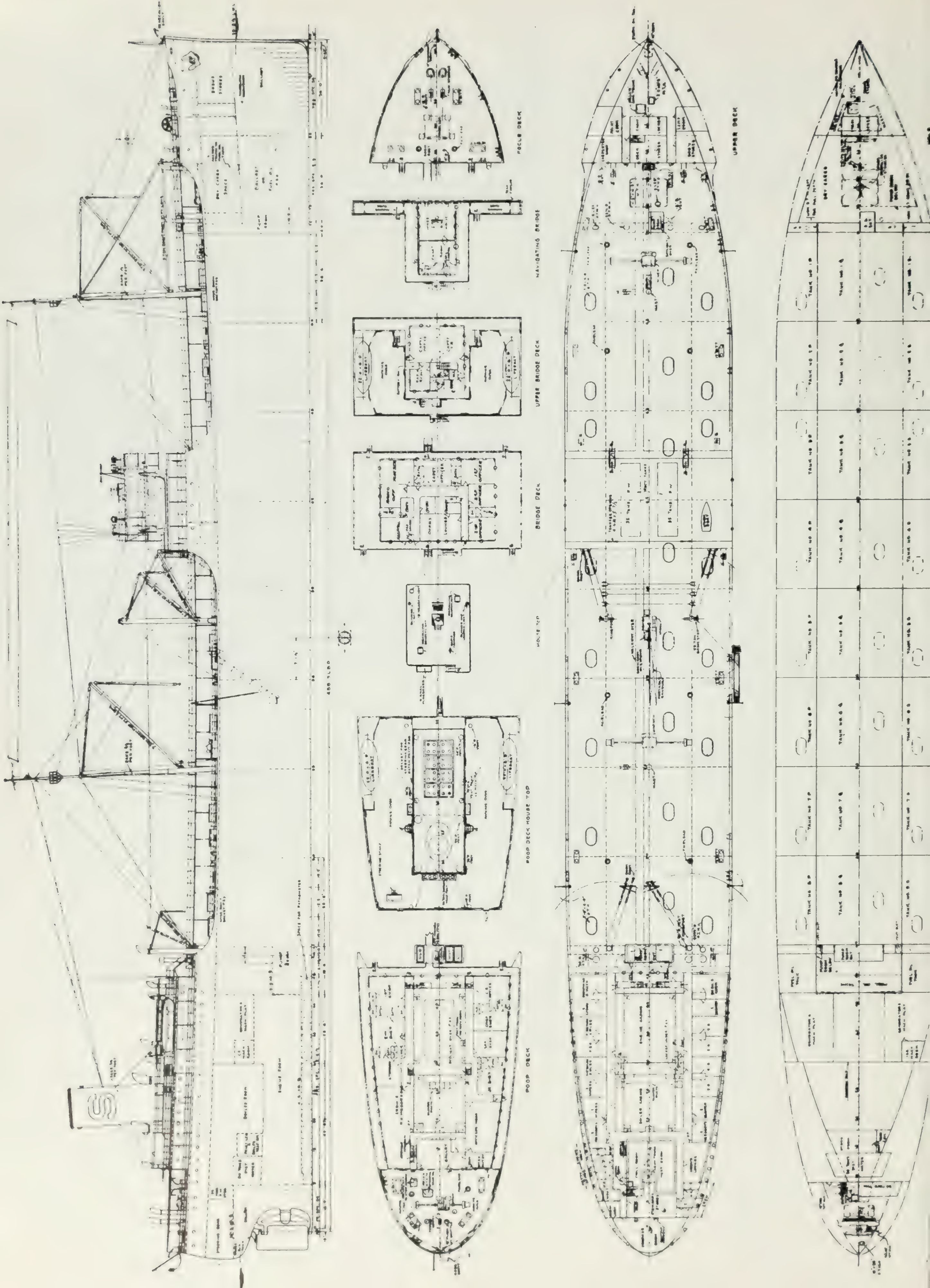
To accomplish this remarkable result, the following steps were taken.

First, an analysis of the hull lines was made, and it was determined that the bow lines should be somewhat fined in order to make the required speed with economy.

Second, a careful survey of the machinery requirements indicated that the fore and aft space devoted to machinery would take care of the more powerful machinery without crowding. There was a slight reduction of the space available on the operating platform but not enough to in any way affect the handling of the throttle controls. In fact, there is more room on the Corsicana for the working of these controls than is provided on many of the world's noted steamships.

Third, a rearrangement of the spaces forward and aft of the cargo tanks and in the superstructure amidships provided ample room for such national defense requirements as gun foundations, ammunition magazines, and additional crew accommodations.

An interesting feature of the machinery installation was a new design


FOCSLE DECK
NAVIGATING BRIDGE
UPPER BRIDGE DECK
BRIDGE DECK
HOUSE TOP
POOP DECK HOUSE TOP
POOP DECK
UPPER DECK
600'-0" LBP
S

of the Foster Wheeler water tube boiler which flares out to take advantage of the greater beam available as the frames of the ship at the stern curve outward from the run to the propeller. The Foster Wheeler Company has named this design the "P" type in honor of Mr. Pluymert.

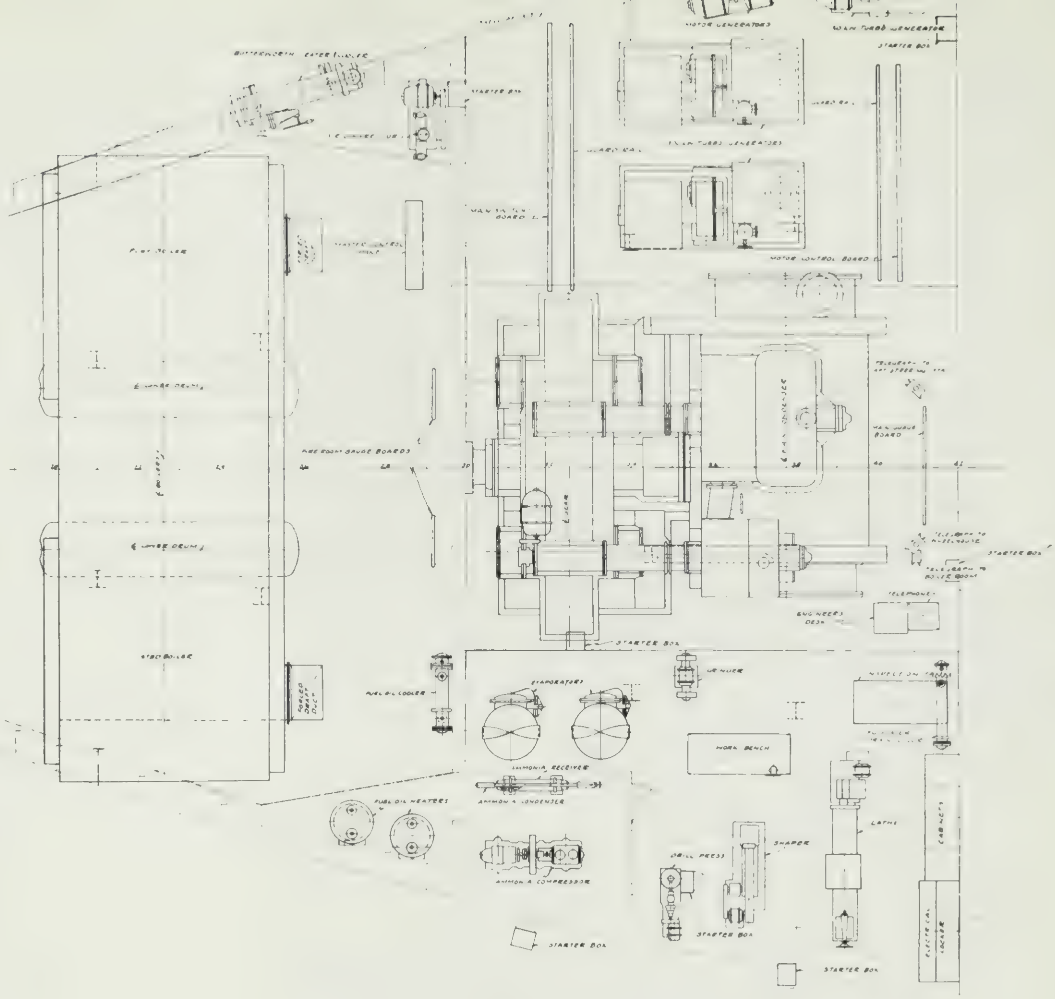
Corsicana was named for the oil town Corsicana, Texas, where oil was first discovered by Texans in 1894. Her five sisters will all be named for Indian tribes or chiefs whose names begin with the letter C. The names now selected are Caddo, Calusa, Catawba, Colina and Conastoga.

These tankers are all to be equipped with the spacious de luxe crew accommodations now characteristic of American cargo carriers.

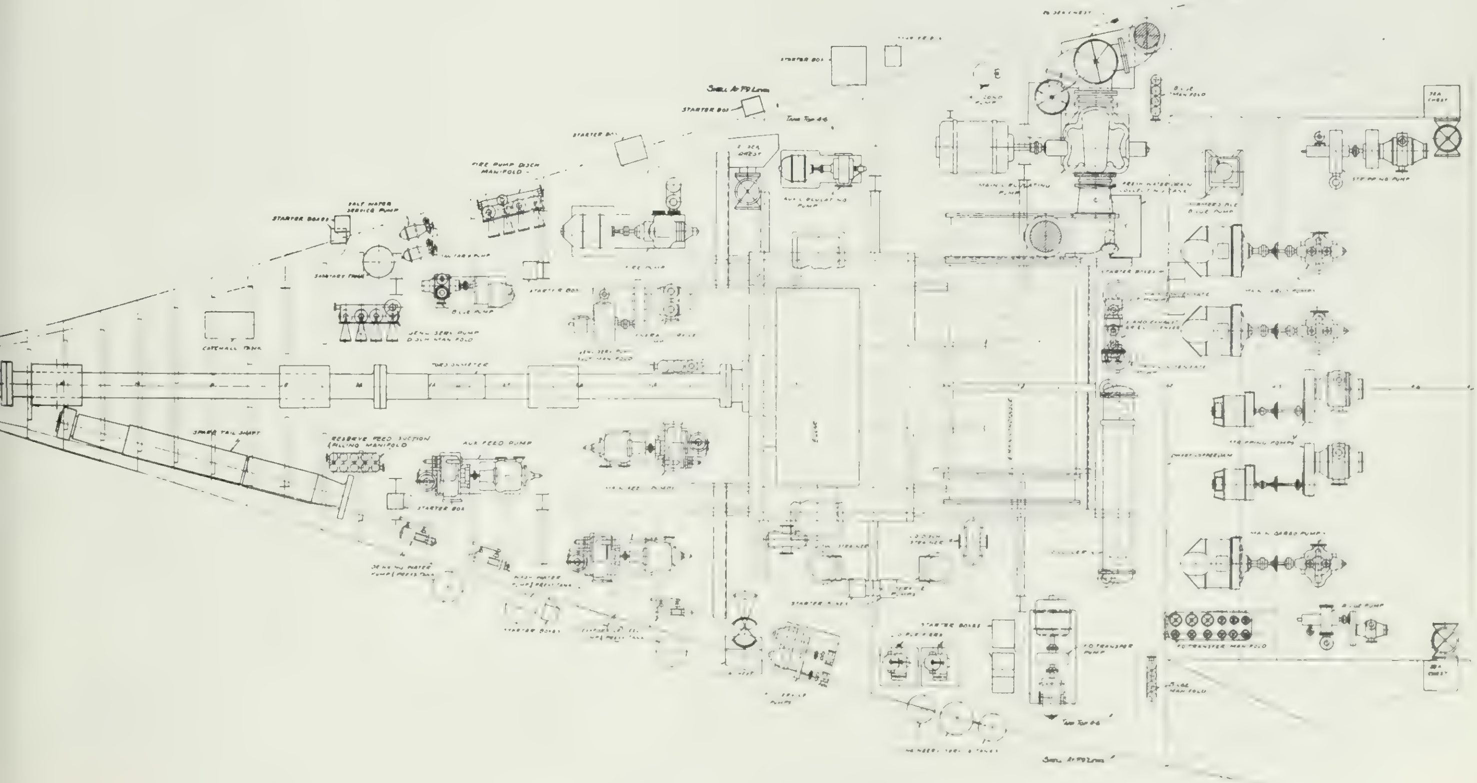
Machinery Installation

The propulsion plant in each of these tankers comprises a pair of water tube steam generators supplying steam at 375 psi and 700° F. to a set of cross-compound, double reduction-geared turbines that are designed to deliver 12,000 shp at 105 rpm of the propeller shaft.

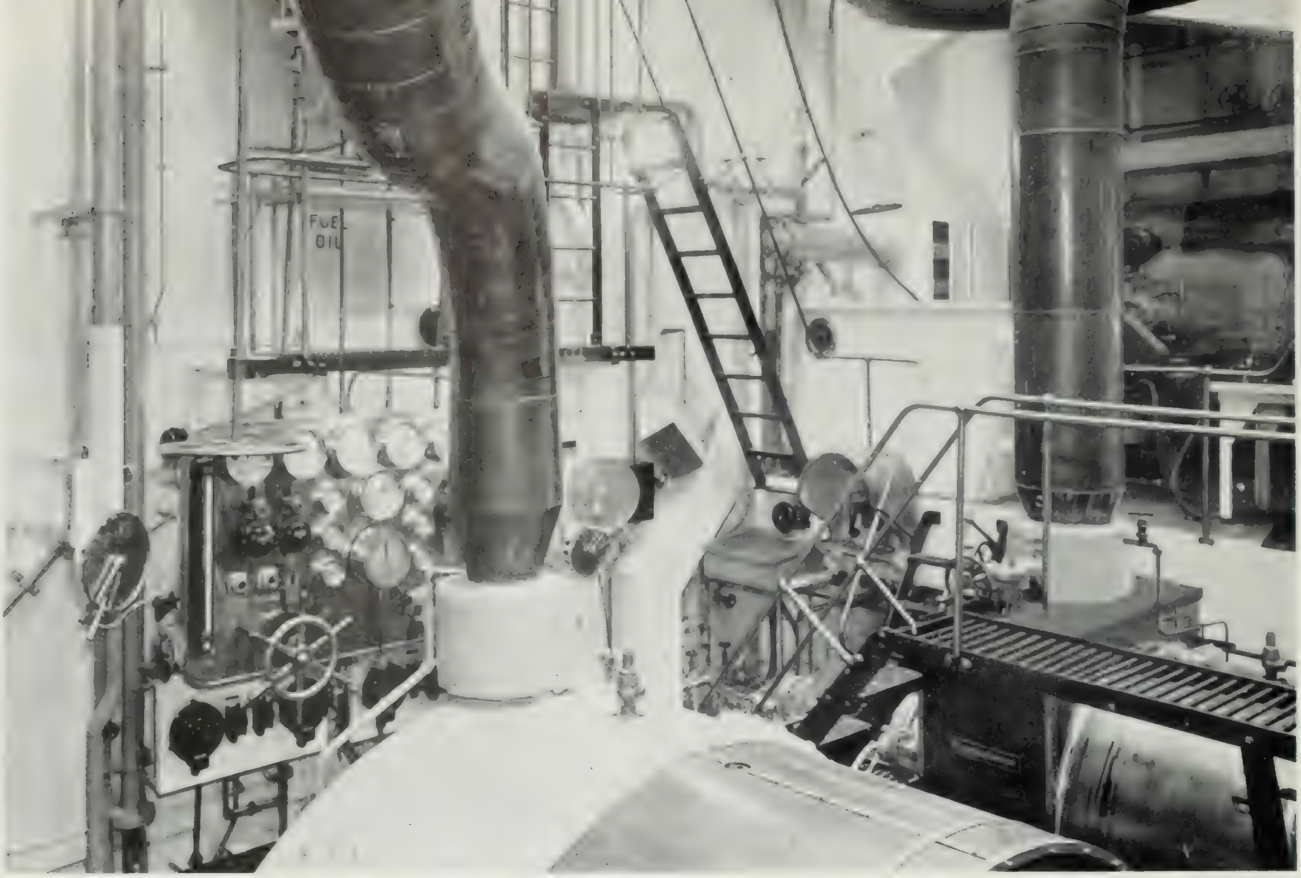
On the Corsicana and three of her sisters, the turbines, gears, main con-



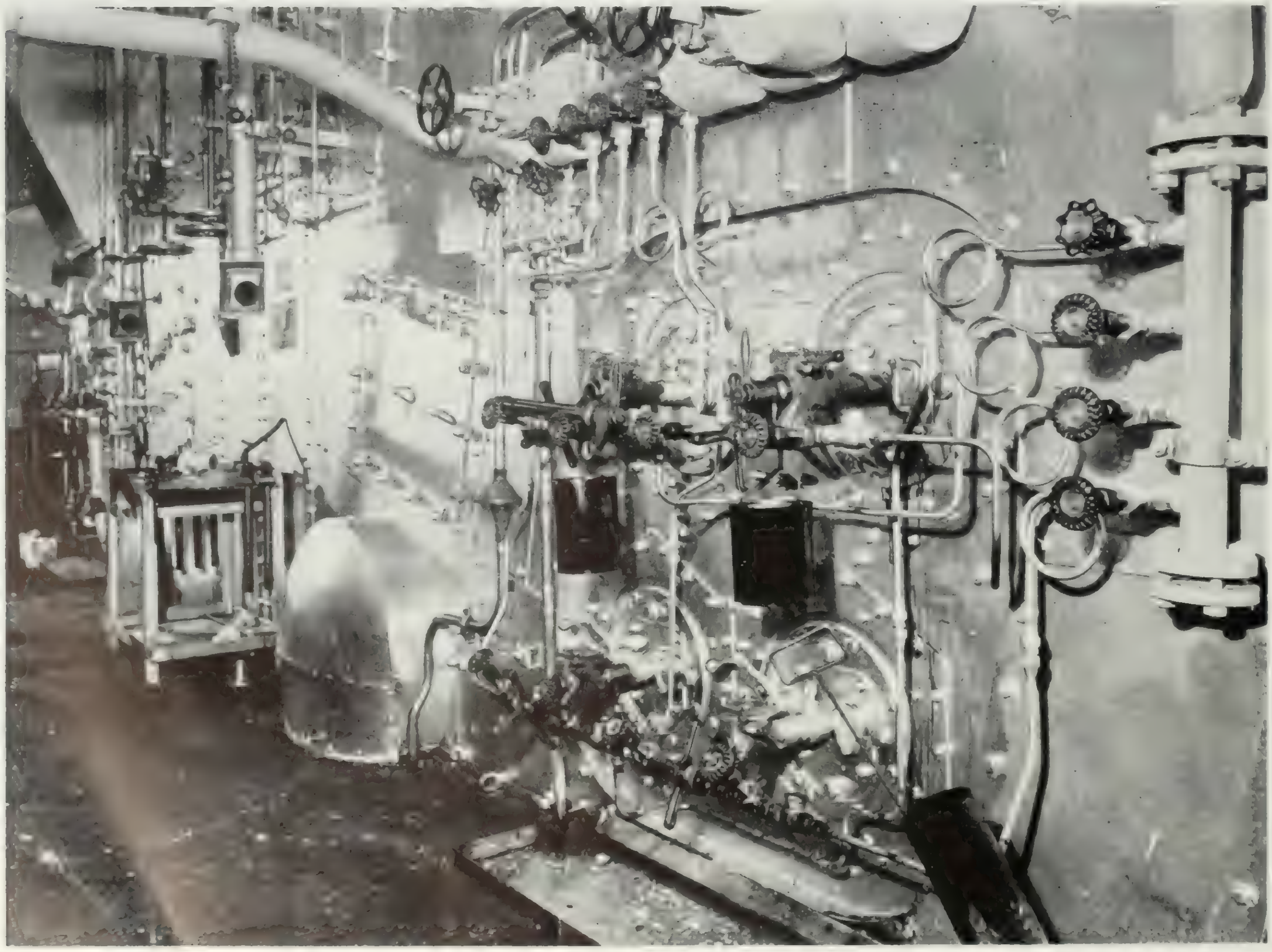
Arrangement of machinery on upper platform



Arrangement of machinery on engine room floor



Above: Operating platform showing Westinghouse turbine casings. Below: Fronts of the P Type Foster Wheeler steam generators



densers and air ejectors were supplied by Westinghouse Electric and Manufacturing Co.; and on the other two the turbines are to be General Electric with Bethlehem condensers.

Furnished by the De Laval Steam Turbine Co. are: the motor-driven main and auxiliary circulating and condensate pumps servicing the condensers; the motor-driven lubricating oil service pumps; the main feed pumps and their turbine drive; the motor-driven fire pump; and the motor-driven main cargo pumps.

For cleaning lubricating oil, De Laval Unimatic oil purifiers are provided.

The deaerating feed water heaters of the surge tank type were furnished by the Elliott Company. These tanks are so installed as to give a good suction head on the main feed pumps.

General service heat exchangers, such as the lubricating oil coolers, the fuel oil coolers, the heater drain coolers, the evaporators, the distillers and the salt water heaters, are all from the Davis Engineering Corporation.

The steam generators furnished by the Foster Wheeler Corporation are equipped with: Todd variable capacity oil burners and oil heaters; Kinney fuel oil service and transfer pumps; Vulcan soot blowers; American Blower Corporation forced draft blowers; and combustion control by General Regulator Corporation.

Torsion meters for measuring the shaft horsepower of the turbines and salinity indicators for testing the condition of the boiler feed water were supplied by McNab.

General Electric Company supplied the auxiliary power plant which includes in each ship: two 300-kw turbogenerator sets; one 50-kw turbo-generator auxiliary set; two 25-kw motor-generator sets; a switchboard for distributing current for lighting, cooking and auxiliary power; and practically all the motors for driving the auxiliary machinery.

All deck machinery including the electro-hydraulic steering gear is by the American Engineering Co.

All electric motor controls are the product of Cutler-Hammer, Inc.

National Transit Pump & Machine Co. furnished for each ship the general service, engine room bilge, pump room bilge and three cargo stripping pumps. The general service pump and one cargo stripping pump are driven by Whiton turbines; the others are motor driven.

The rotary type ballast pump is by the Kinney Manufacturing Co., driven by a Whiton steam turbine.

All main cargo pumps are electric motor drive and are furnished by De Laval.

Steam pressure reducing valves and the steam whistle are by Leslie.

Galley range and much of the accessory equipment in the galley were installed by the Edison Electric Appliance Co.

Navigation Equipment on the bridge included: sounding machines and compasses furnished by Kelvin and Wilfred O. White Co.; complete master gyro compass and repeaters, course recorder and helm angle indicator furnished by the Sperry Gyroscope Company; and the Fathometer echo-sounding apparatus installed by the Submarine Signal Corporation.

Officer's room (above), and typical seaman's room

Radio equipment on the Corsicana was furnished and installed by the Mackay Radio & Telegraph Company and consists of the following:

155-B Intermediate Frequency Main Transmitter, 300-watt power output.

156-A High-frequency transmitter, 200-watt power output.

149-A Emergency intermediate frequency transmitter, 50-watt power output, operated from emergency storage battery source of supply.

101-B Auto Alarm equipment with 101-A radio control panel, including 103-A master antenna control switch, charging equipment, etc.

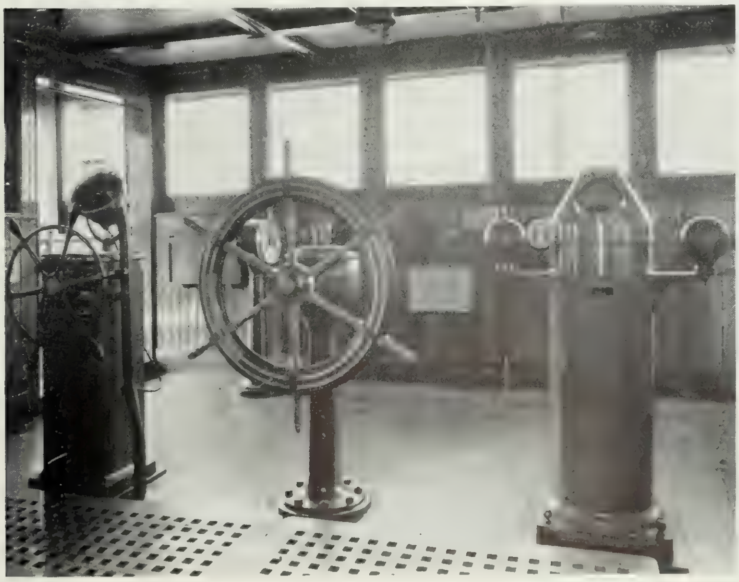
105-A Binnacle type direction finder, with automatic compensator, including loop and sense antenna.

117-B All-wave receiver (low, intermediate and high frequency marine bands all covered).

122-B Auxiliary stand-by intermediate frequency receiver.

123-B Emergency crystal detector receiver.

Complete main and auxiliary antenna systems.



Commander A. M. Sobieralski of the U. S. Coast and Geodetic Survey at Seattle, speaking at launching

New U. S. Coast and Geodetic

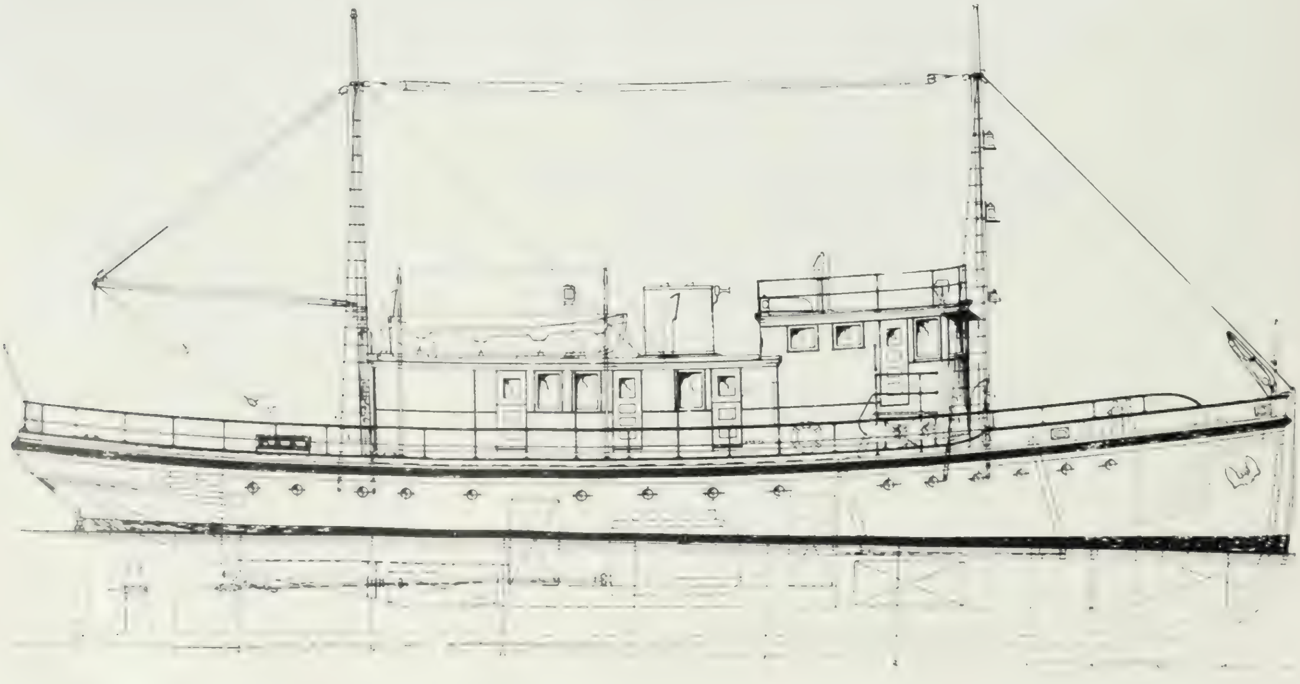
The Motorship Patton, Launched at the Maritime

These are days when the launching of so many great ships make those of smaller but equally useful vessels seem insignificant. But many smaller vessels are coming off the ways which have important work to do, and not all of these are war vessels.

As Commander A. M. Sobieralski of the Coast & Geodetic Survey, speaking at the luanching of the new 88-foot motor survey vessel Patton at Seattle last month, said: "In dictator-ridden nations, the launching of a new ship always means new aggression, new terrors, new conquerings . . . but to us a launching more often carries only the thought of peace and the pursuit of peaceful commerce. Many sea lanes are closed today by war, but this ship and others like her will go on opening up new channels, new routes, new vistas, for a commerce which we hope will be untouched by violence."

The Patton was designed for the Coast & Geodetic Survey by H. C. Hanson of Seattle, who has planned in the past few years many successful vessels for the Government, among them a sister ship to the Patton, the E. Lester Jones, which recently completed her third successful season in Alaskan waters. She was built by Sivert Sagstadt, veteran Seattle builder, together with his associates at the ways of the Maritime Shipyards.

In dimensions she is 88 ft. long, 21 ft. beam and 8 ft. draft, with hull construction of wood. Her main power plants are twin 150-hp, 6-cylinder Cooper-Bessemer diesels turning two 48" wheels at 600 rpm. Her auxiliary sets are two John Reiner Co. 14-hp diesel generating sets, with Exide battery sets for reserve. The shafts from the main engines are Monel metal and are fitted with Goodrich rubber cutless stern bearings. The rudder is of the single bronze plate type with wooden cover.



Outboard profile of U. S. Coast and Geodetic Survey motor vessel Patton

Survey Vessel

a Fine Wooden Hull, Shipyards Seattle, Wash.

Miss Katherine Sobieralski, daughter of Commander A. M. Sobieralski, acted as sponsor at launching of M. S. Patton

Hull design, as shown by the outboard profile, has fair flush deck with plumb bow and raking forefoot, and a knuckle-type stern with good freeboard aft, making a seaworthy type for the rough northern waters the Patton will be forced to navigate from time to time. There are some characteristics of the halibut vessel, but the lines are much finer and speed possibilities greater.

Construction is heavy, with Wolmanized lumber throughout. Hull has double sawn 4″ fir fletches on 18″ centers; 2½″ and 3″ planking with 4″ ceiling, shelves and clamps; and 2½″ decks. Four watertight bulkheads divide the vessel. All bolts were furnished by the Pacific Coast Forge Co. The fastenings are Monel Metal and Herculoid throughout.

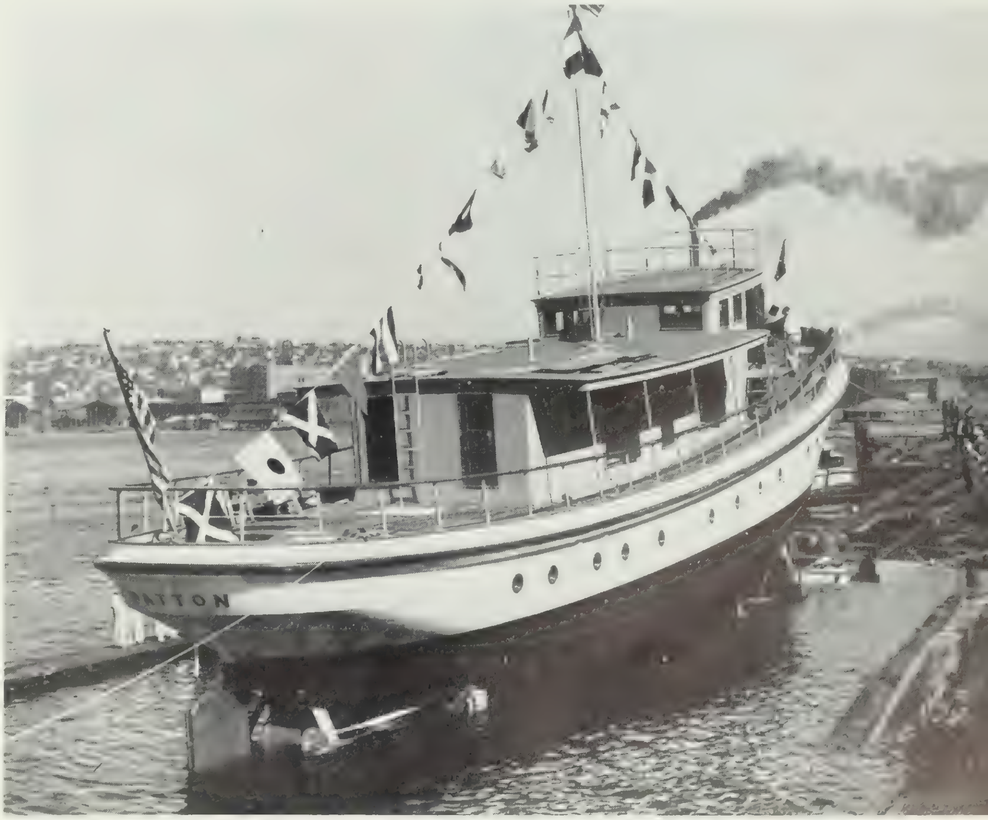
For sounding, the vessel is equipped with a Fathometer. Special generator wiring and switchboard were handled by the Nordic Electric Co. of Seattle, and the bronze work by the Elliot Bronze Co. There is a CO_2 automatic fire extinguishing system, Frigidaire Freon refrigerator, an Arco Red Flash boiler and heating radiators.

The galley is all done in Monel Metal, contains a Lang oil-burning range, and is equipped for long cruising. Crew's quarters are forward and ward room aft, each with special bathrooms and Sands electric toilets. Galley, mess room, washrooms and other accommodations are in the deckhouse, with an unusually large pilot house forward so as to provide for the use of large charts.

Other equipment includes a Fairbanks-Morse fresh water system, Ross heat exchangers for water cooling, and Vortex spark arresters on all diesel engines.

Under command of Lieut. Casper M. Durgin, the new $150,000 vessel is expected to go into service about November 1. She will probably operate this winter in Rosario Straits, Puget Sound and later in Southeastern Alaska. She has a cruising radius of about 4500 miles.

It is understood that her design has been adopted as standard for other Coast & Geodetic vessels of this size and type.



U. S. Coast and Geodetic Survey motor vessel sliding off ways at the yard of Sinert-Sagstadt, Seattle, Washington

Overhead electric trolley handling a large fabricated pipe bend.

The "Crane Co." Plant at San

Anticipates National Needs of its

The "all-out" national defense effort is meeting enthusiastic cooperation from industry and from the suppliers of manufactured and fabricated materials. The suppliers need enthusiasm, vision and inspired common sense to even approximate meeting the present demands of industry.

At the San Francisco plant of the Crane Co. the executives are men whose experience runs back through the hectic days of World War I. Sometime back they saw what was coming and began preparing for it. As a result, the plant is well-equipped and stocked to take care of unusual demands, and also, largely due to the same cause, the San Francisco branch, as compared with all other Crane branches in the United States, has led in volume of business for the whole of 1940 and the first half of 1941, being exceeded only by the main home office in Chicago.

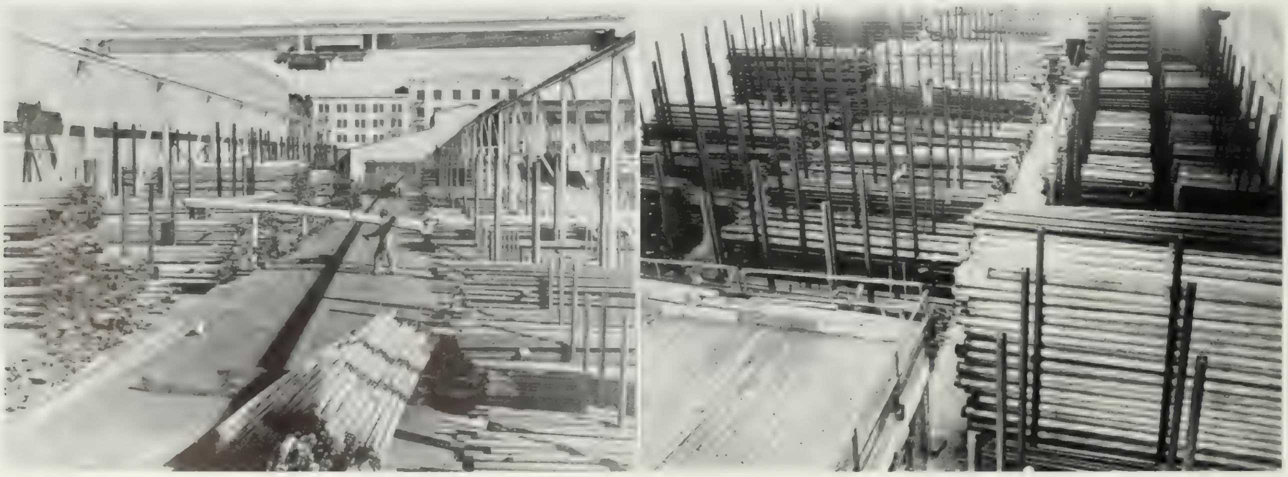
The pictures herewith show the plant as it is today. Of principal interest is the increased capacity of the pipe storage and the fine layout of equipment for fabricating large pipe by welding and for producing pipe bends.

As shown in the general view, the plant comprises: a large office, warehouse, showroom and shop building; a pipe storage warehouse; and a pipe storage yard. The yard has been recently arranged so as to relieve congestion in the warehouse, and the rear space in the warehouse has been devoted to fabrication by welding.

A two-ton electric traveling bridge crane spans the entire pipe yard and spots pipe for storage or loads it on trucks for delivery. The yard has a normal capacity for storing 1600 tons of pipe.

Eighty feet of the pipe warehouse is taken for the welding shop and pipe bending slabs. Here bends of all sorts are made to specifications. The pipe benders here are very expert workmen of long experience.

For the larger sizes it is often more advisable to form the necessary bends by welded fabrication. Sections of the bend are cut out of straight pipe, and,



Two views in the "Crane Co." pipe storage at San Francisco, showing, left, the pipe yard with its overhead electric bridge crane, and, right, the interior of pipe warehouse.

Francisco Defense Territory

The "Crane Co." establishment at San Francisco consists of a six-story office, shop and warehouse building, a pipe warehouse and shop, and a pipe yard.

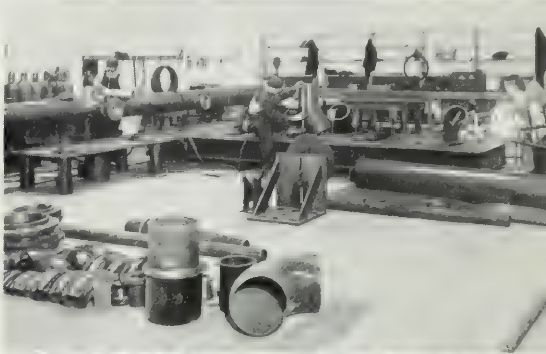
welded together, former quarter or half circles or any angle desired. Every welder is an experienced craftsman and is certified by the Hartford Steam Boiler Inspection Service and by the State of California.

The pipe warehouse and the welding shop are served by a Shepherd electric monorail hoist with sufficient capacity to take care of the heaviest lifts required.

A machine for rolling Crane "laps" and a furnace to serve that machine are a feature of this plant. This machine has ample capacity to roll "laps" up to 22-inch diameter.

Our pictures show very graphically some of the types of work that are constantly progressing through the Crane shops. Well equipped, of ample capacity, and manned by experienced skillful craftsmen, this plant is ready to undertake fabrication of any size pipe for any pressure condition.

An ample stock of marine pipe specialties is maintained at a level sufficient to promptly meet ship-operating and shipbuilding needs. Valves of all types and individual sizes used aboard ships are available on very short notice. Marine type plumbing fixtures and bathroom fittings are stocked in quantity. In short, the San Francisco plant of the "Crane Co." is exerting an "all-out" effort to meet all national defense requirements in its line and in its territory.



A corner of the pipe fabrication by welding shop.

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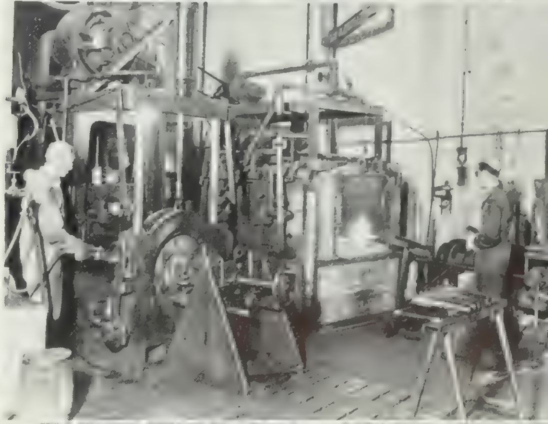

Furnace and forming machine for producing the celebrated Crane "laps"

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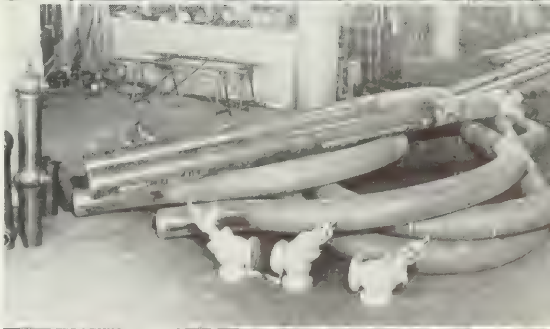

Example of steel pipe bends, fabricated by welding, and a few special valves.

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The bending slab. Workman is forming a bend for steel steam pipe on U. S. Army transport.

News FROM THE PACIFIC NORTHWEST

by Daniel L. Pratt

Shortage of Steel Delays Building

Yards in the Pacific Northwest and especially at Seattle are being seriously delayed by the shortage of steel. Several yards, with defense contracts many months old, are waiting and ready to go, but have barely made a start beyond expanding their plant facilities. The situation is making the shipbuilders gray-headed, and great relief will be manifested in building circles when the essential construction material begins to roll in.

Tacoma To Be Ore Terminal

Tacoma has been designated as a special terminal for shipments of manganese and chrome ore from the Philippines. A recent contract between Ralph Shaffer of Shaffer Terminals, Inc., Tacoma, and C. O. Bradshaw of the Metal Reserves Co., a subsidiary of the R. F. C., plans to establish stock piles and warehouse facilities for 100,000 to 200,000 tons of ore. This ore as needed will be transferred by rail to the East Coast. It is understood that similar terminals will be set up in San Francisco and San Pedro.

Hemp shipments have been made to Tacoma in this manner for some months and it is possible that rubber may also be included in the program. Tacoma is a natural center for ore cargoes as the great Tacoma smelter has for many years drawn shipments of copper and other metals from all over the coast.

Eight More Ways For Portland

Tentative advices were received in Portland, September 11, that eight new ways may be added to the Oregon Shipbuilding Co. plant in that city, greatly increasing the size of an institution that already has eleven ways, with keels laid on all of them, and contracts for forty-three freighters. At time of writing this plan had not been officially confirmed and there was possibility that a new eight-way yard might be established instead of adding to the size of the present one, but the point seemed certain that facilities of such extent were to be added somewhere along the Portland shipbuilding front.

Imports at Ten-Year High

According to the Seattle office of the Department of Labor, the imports by water to Puget Sound and other Washington ports for the first six months of the year totaled $26,974,000, which is a new high for the past ten years and compares with only $19,000,000 last year. The jump is attributed largely to the bringing in of materials for Washington's great defense industries, and applies, of course, to foreign imports only.

Plywood Ships To Be Built

William Henderson, Seattle industrial engineer, and his associates, which include Seattle and Grays Harbor businessmen, have taken an option on thirty-three acres of land on the Chehalis River at Aberdeen, Washington, and propose to set up an industry building plywood ships. It is announced that the vessels are for Army and Navy use and that operations will start immediately. The ships will be 45 to 150 feet in length, of the "mosquito fleet" type, used so widely in the English Channel. Associated with Henderson is I. F. Laucks of the well-known firm of Seattle chemists and manufacturers. Laucks has been a leading national factor in developing waterproof plywoods. He and Henderson recently returned from a trip to Washington where they conferred with the Navy Department. Construction of the ships would be under Navy direction. Name of the company will be Prefabricated Ships, Inc. Plans call for the construction of ten ways and work would be on an assembly-line plan. While the idea is new in the Pacific Northwest on vessels as large as these, it is understood that similar vessels are being built in the Southeast.

Wood Building Record

Unhampered by the shortage of steel, wooden yards are making good progress on most of their defense ships. An instance of this is what has been done by the Bellingham Marine Railway & Boatbuilding Company at Bellingham, Washington, on a contract let three months ago for four mine sweepers, wooden vessels of 135 feet length. All vessels are framed, one sealed and being planked, and, by the time this is published, all four will be well under way. H. C. Hanson, Seattle naval architect, is supervising the construction and spending much of his time in speeding the work along. Progress is being made by all the wooden yards, but facilities are still available which are not being used.

New Navy Base at Port Angeles

The Navy's new section base at Port Angeles, Washington, which will serve as an operating base for mine sweepers and inshore patrol boats, was commissioned with simple ceremonies on September 4. The new base is on Ediz Hook near the Coast Guard aviation base and includes a dock, barracks, administration building, officers' quarters and a machine shop. Command of the station has been assumed by Lieut. Allen Grant, U. S. N. R., who had charge of commissioning it. Similar bases are being commissioned at Astoria, Marshfield, Neah Bay and other Northwest points.

Salmon Chokes Storage Space

The Port of Seattle on September 5 requested the Navy Department to loan back the west half of Pier 41 for a month, to facilitate the unloading of the Alaska salmon pack, this pier being under lease at present to the Navy. All available warehouse space of the Port of Seattle as well as of private piers was choked and a serious situation was developing. "The large number of ships in service to Alaska," said Col. W. C. Bickford, port manager, "taking supplies north for military bases, are returning with much heavier salmon cargoes than we expected so early in the season. These ships cannot lie around idle, waiting for a space to unload salmon, as their services are too badly needed." Dockage and warehouse space has become very difficult to obtain on the Seattle waterfront. Congressman Warren G. Magnuson at Washington is advocating a $5,000,000 loan to build two 1000-foot docks for the port to relieve the congestion, and two RFC men are making an investigation of the situation. "Meantime," as Horace P. Chapman, president of the Port Commission, stated, "this will take two years and doesn't right now take care of the salmon, which is badly needed by the War Department as well as by private consumers."

Six New Steel Tugs

The Birchfield Boiler Co. of Tacoma began work September 2 on a $1,800,000 order for six steel tugs for the Maritime Commission. The tugs will be full-welded jobs, largely fabricated on the floor of the plant. The same company is also constructing a tug for the Coast Guard for use on the Columbia River. It is understood that the plant is to be doubled in size.

Conversions Nearly Completed

After months of delay because of changes in plans due to the rapidly changing requirements, the conversion of the liners President Grant and President Jackson into Navy transports is nearing completion at the Todd Drydocks, Inc., at Seattle. Naval authorities say the conversions are actually being completed on schedule but that the schedule has had to be changed as the work went along. Except for their hulls, both ships have been virtually rebuilt. They have been renamed the Harris and the Zeilin.

Important Harbor Group Convention

The 20th annual meeting of the Northwest Rivers and Harbors Congress will be held in Everett November 14 and 15, and, in view of the large defense works being carried on at major ports, it is expected to draw a record attendance. Army engineers as well as leading businessmen and port authorities will be invited to be principal speakers and to lead the discussions, and the meeting is looked forward to with special interest because it is believed that many needed major improvements will be suggested.

Capt. Macauley Visits Sound

Capt. Edward Macauley of San Francisco, the only West Coast member of the Maritime Commission, spent some time in the Pacific Northwest in September reviewing the progress of the Commission's shipbuilding efforts. At a banquet given in his honor by the Seattle Chamber of Commerce, he stated that nearly one-third of the approximately 1400 ships destined to come off the ways in the next two-and-one-half years would be constructed on the Pacific Coast.

Marine Shorts

As part of the largest nation-wide mass launching of ships since the last war, an occasion which was scheduled for September 27, the army transport **Fredrick Funston** slid from the Tacoma ways of the **Seattle-Tacoma Shipbuilding Corporation,** taking part in the celebration along with many other ships that were launched from various ways along East, West and Gulf Coasts on "Liberty Fleet Day." The Funston is the first of the new C-3 type vessels to be built at the Tacoma yards. Originally intended to be a cargo ship, she was converted into a transport. Two other C-3 types, as yet unnamed, are in the firm's Tacoma yards.

* * *

Seattle will probably have an opportunity to look at the Maritime Commission ship **American Sailor,** as she is tentatively scheduled for a four-day stop-over there September 29 to October 2. Capt. W. H. Munter of the Coast Guard has already made berthing arrangements at a point convenient to visitors. She is operated by the Coast Guard and is assigned to a station at Hueneme, California. In command is **Lieut. Com. A. C. Richmond** of the Coast Guard. She will also visit other Sound and Columbia River ports.

* * *

Due back from the North at this writing is the Coast and Geodetic survey vessel **E. Lester Jones,** which has been on an important assignment this season in connection with the defense projects in the north, resurveying Cooks Inlet and other waters where navigation of freight transports has been essential. As a special duty, she piloted a large transport through the shallow and difficult passages to Anchorage. Other Geodetic vessels returning are facing new careers during the winter. **Explorer** will be assigned to duties west of Hawaii and **Discoverer,** already back, is no longer a member of the survey fleet but has been traded to the Navy for the **YP96,** one of the coast patrol vessels recently converted from a deep-sea fishing craft. The other vessels will probably remain all winter in active duty in Puget Sound waters.

* * *

The **Milwaukee Railroad** has been compelled to enlarge the size of its Puget Sound Fleet. Prior to the recent great increase in railroad business, this railroad had only three barges in the Olympic Peninsula and Bellingham service. Now it is using six barges and a towboat, plus other chartered tugs, handling a total of 82 cars. A port captain's office has been established in Bellingham and the barges are dispatched with the regularity of train schedules.

* * *

The latest link in the chain of Uncle Sam's swiftly-growing Alaska defenses, the **Dutch Harbor Naval Air Station,** in the Aleutians, went into operation September 2. This base, on the largest island in the group, commands the 1200-mile chain of islands extending toward Siberia. **Commander W. N. Updegraff** became station commander. The cost is estimated to have been around $15,000,000. Two other Navy bases are being built, one at Kodiak and the other at Sitka. The contract of the Puget Sound-Siems-Drake Co., which is building these bases, was increased last month by an additional $26,000,000.

Marine Short-Shorts

The **Seattle Harbor Patrol,** which saves lives indiscriminately within city and county limits, will be supported for the first time this year in part by the county . . . **Halibut vessels** out of Seattle made 104 trips during August, handling 2,910,000 lbs. of fish, and sold their catches for $387,968 . . . The schooner **Commodore** of the Puget Sound-Hawaiian run and other important trade routes, has been sold to San Francisco shipping interests and will be used in Pacific Coast lumber trade, where rates have again become high enough to make a windjammer profitable. She has been on the ways of the **Winslow** Shipyard, Bainbridge island, for overhaul and reconditioning.

Construction of a tug and barge to tow gasoline from San Francisco and Los Angeles to Portland, the Dalles and Pasco has been started by A. Lappauoto, president of the **Upper Columbia River Towing Co.,** and it is understood that similar measures are contemplated to meet a possible shortage created by the diversion of tankers from the Pacific Coast to British aid service . . . A million gallons of gasoline were shipped in steel tank cars to Portland by **Shell Oil** recently . . . Five Puget Sound yachts already have been definitely allocated to the Coast Guard Reserve and three more are to be taken over shortly. **Capt. Munter,** Coast Guard commander for this district, says that at least twenty will be needed . . . One of the greatest runs of Chinook salmon ever to make its way up the stream added considerably to the prosperity of the Columbia River fishermen during September. This followed a good tuna catch with unusually high prices . . . **Black Ball Ferry Line** has announced a winter schedule with practically as many sailings as during the past summer, reflecting the increased travel to shipyards and defense bases . . . **General Petroleum's** tanker **Mohave** has been added to the fleet that will carry aviation gasoline to Russia . . . Showing a 25.7 per cent gain over the same period last year, shipments of merchandise out of **Alaska** for August totalled $21,236,000.

Cargo winch production line at American Engineering Co.

Personal Gleanings

Past Assistant Surgeon **Reuben A. Zarilli** of the United States Public Health Service has been appointed as a special medical officer to the Coast Guard in the Seattle district. He comes to Seattle from the Marine Hospital at Detroit . . . **Dean Ballard,** manager of the Foreign Trade Department of the Seattle Chamber of Commerce, has left for California to make a study of how San Francisco and Los Angeles are handling commodity shipments of defense materials from the Orient to eastern points . . . Seattle shipping men turned out September 4 to pay a farewell tribute to **James R. Meston,** marine surveyor, engineer and salvage expert, who died September 2. Mr. Meston was well-known, liked and respected in marine circles. Capt. **Crin Shephard,** 62 years old, founder of the Shephard Towing Co., died at his home at St. Helens, Oregon, September 4. He was for a long time skipper of the river boat **America,** plying between St. Helens and Portland, and later, in 1914, founded his own towing business . . . **Alexander Muir McDonald,** the Scotch-born Seattle man who turned out a fleet of wooden ships during the world war, died on September 12. He learned his craft at the famous Clyde shipbuilding centers and had a long and varied experience.

Production Line for Cargo Winches Necessary

With shipbuilding already far beyond the peak of World War I, the construction of marine deck auxiliaries, especially winches for tankers, has made production - line manufacture necessary.

The American Engineering Company, Philadelphia, has set up a winch line in its No. 2 plant to meet the industry demands. In the illustration are six compound - geared, two - speed winches for handling light and heavy loads. These machines, being built for the Bethlehem Steel Corporation, have double cylinder reverse valve engines.

The mechanic in the foreground is fitting heads on the steam cylinders. The second man is drawing up the nuts on the stuffing boxes for the pistons and crossover piping. The third and fourth men are lowering a drum group into position on its bearings. One of the drum groups ready for installation lies in in front of the third winch. The last man, in the background, is fitting on the gear guards.

Because of the weight of the winches, they remain stationary while the men move, a departure from usual production line methods. The winch line has greatly speeded up production by centralizing men, tools, material and handling.

News FROM THE PACIFIC SOUTHWEST

by K. M. Walker

New Consolidated Yard at Wilmington

In the interest of national defense, the Federal Government recently condemned approximately 30 acres of land in Wilmington to provide an eight-way shipyard for the Consolidated Steel Company, where eight ocean freighters will be built simultaneously.

Federal Judge Harry A. Hollzer handed down the necessary possession order, and the buildings now occupying the private property will be removed at once, and the owners compensated for their holdings. There was little opposition to the proceedings by property owners. The terms of the condemnation allow the Government to use the land for five years with the privilege of canceling after a year's occupancy on sixty days' notice.

A complete ship assembly plant will be erected to take pre-fabricated materials from the company's Maywood plant to complete the hulls and to receive and install machinery from the plants of sub-contractors. First two keels will be laid late in November, and thereafter keels will be laid at a minimum rate of two per month. Thirty C-1 cargo steamers are now allocated for building at this yard.

Consolidated Steel Company delivered September 15 the C-1 cargo steamer Agwimonte, first of four C-1 vessels it is building for the U. S. Maritime Commission at a leased Long Beach yard. Agwimonte had satisfactorily completed her sea trials on September 9. She was received for the Commission by L. R. Sanford, who almost immediately thereafter delivered her to Captain W. T. Hall, representing the New York and Cuba Mail Steamship Company. Her sister ship, Agwiprince, which will have her sea trials late in October, is also allocated to the New York-Cuba line.

The third and fourth vessels are named, respectively, Alcoa Pennant and Alcoa Polaris. On completion they will be operated by the Alcoa Steamship Company.

Mexican Ports Benefit By Defense

A tour of Mexican Pacific Coast ports reveals that many towns in the land of Mañana, for years wrapped in perpetual siesta, have suddenly burst into activity and are now hustling in a manner more befitting their northern neighbors. At Santa Rosalia, near the head of the Gulf of California, the great copper mines, acquired by a Mexican syndicate from the French concession after the fall of that republic, are employing over seven-thousand workers on three shifts. The ore produced by these mines is being shipped to smelters at Tacoma, Washington, for reduction. The steamers Providencia and Argyll are engaged in moving several thousand tons monthly to the Tacoma smelters.

General Abelardo Rodriguez, ex-president of Mexico, has expanded his holdings considerably, and has established new shrimp and fish refrigerating plants at Guaymas and Topolobampo, and plans a large cannery to be

On September 15, the Consolidated Steel Corp. delivered the C-1 cargo vessel Agwimonte, first of four sister ships building at their Long Beach yard established at Mazatlan. At Guaymas has been built a modern shipyard and repair plant, also Rodriguez-sponsored. This was badly needed as the Mexican coast ports are sadly lacking in building and repair facilities. The tropical waters of the Mexican coast require the many wooden vessels to be docked several times a year, which has formerly necessitated the long run to San Diego for this service. The Guaymas yard is busy with several Mexican Government patrol boat contracts as well as with general repair work.

A fish cannery, which has been closed for about ten years, has been reopened at Turtle Bay and is now shipping their product to San Diego brokers. This little community, which until recently was only a refuge for weatherbound Tuna clippers, has suddenly taken on some importance.

At Manzanillo the copra mills are going at top speed in the manufacture of vegetable oils but are having some difficulty in getting copra due to the shortage of tonnage from the Philippines and other sources of supply. Mexico is therefore seeking to obtain vessels to enter this trade under their flag as well as to transport freight, which is accumulating in the West-Coast Mexican ports.

Probably the most active Mexican port is Salina Cruz. This port suffered a serious setback with the opening of the Panama Canal, which left her docks practically idle until recently. Today, the Mexican Government, with the aid of Uncle Sam, is spending $7,000,000 toward improvement of the harbor and overhaul of the old Tehuantepec Railroad. Dredges are operating to improve the badly silted bay and channel entrances. The Tehuantepec Railroad links the Pacific and the Atlantic at the narrowest part of the isthmus and in the event of damage to the Panama Canal would assume tremendous importance in the movement of freight between coasts. Local people are contemplating the strong possibility that this link, which is barely over a hundred miles between the Pacific and the Gulf of Mexico, will remain of importance after peace is restored as it is over a thousand miles north of the Panama Canal; and moving freight across the approximately 150 miles of railroad would save a 2000-mile water haul on Gulf-bound shipments.

Tuna Fishing Poor

The baby tuna clipper owners of Southern California are puzzled by the sudden and almost complete disappearance of tuna on the local banks. The big, long-voyage boats are doing fairly well but range to and beyond the equator for their catches. The smaller boats, fishing mostly on the Mexican banks, have found the catches so small that they have in many cases given up in disgust and turned to yellowtail. The prices for the latter are not particularly attractive but the operators feel it is better to bring back a load of yellowtail than an empty boat. Even yellowtail have not been plentiful and the sportfishing boats, which closed their season on Labor Day, complain that in past years they have averaged two and a half fish or more per passenger, while this year they have averaged less than one fish per passenger. The sportfishers are a good barometer of local fish conditions.

The total California tuna catch for 1940 went to three and a half million cases, but, at the end of July, 1941, the latest that data are available, indicates a total catch less than half that of a year ago. The local fishermen scoff at the suggestion that the sea is running short of fish, and are inclined to ascribe the shortage to the excessive rains early in the season and recall that bait was almost unobtainable at the start of the season. Very little is actually known about this member of the mackerel family; where it breeds is still a mystery and the vagaries of its wanderings have not been charted.

Another Windjammer Rejuvenated

At San Pedro the big steel gambling barge Tango is being divested of the bulky wooden house which covered an array of roulette tables, faro and blackjack games and rows of one-armed bandits and will be rerigged as a six-masted schooner. Renamed Marie, she will carry cargoes to Vladivostok or lumber between Pacific Coast ports of North and South America.

The ship was built in 1904 at Hamilton Yards, Glasgow, Scotland, has a length of 360 feet and a beam of 49 feet with a deadweight tonnage of about 6000. She will be fitted with steel tube masts a hundred feet long, with wooden topmasts sixty feet in length. It is reported that the Trans-Atlantic Navigation Company will operate the vessel. The refitting of a similar vessel, the Star of Scotland, ex-Kenilworth, into a six-masted jib-headed schooner was described in the April and August issues.

Puntarenas Salvage Work Slow

From latest reports it appears that salvage of the German steamer Eisenach and the Italian motorship Fella, scuttled by their crews the end of last March in Puntarenas harbor, Costa Rica, will require months to complete. The salvage tug Retriever is working on the hulk of the Eisenach but is hampered by the strong tidal currents which restrict sub-surface work to a few hours daily. Divers report that, while the hull of the ship is in excellent condition, the interior has been gutted by fire set by the crew at the time of scuttling, and a large quantity of sand has been drifted into the hull and a quantity must be removed before she can be raised. With the strong current, the hull has been worked much deeper into the bottom than on the day she sank. The divers have managed to close all the sea cocks and other connections through the hull and have repaired the hatches, and, at the last report, the forward hold and forepeak were being pumped out.

The salvagers are devoting their efforts to the Eisenach, and, after she is floated, will turn to the Fella. The latter is in about 30 feet of water in the harbor.

New Kelp Plant To Open

A new $100,000 algin plant, under construction for the Kelco Company at the foot of Sampson Street, San Diego, will start operation early in November. The company operates two kelp harvesters which cut the seaweed between Point Loma and Point Arguello and haul it into San Diego for reduction. About 400 tons of kelp will be used daily in the production of algin, which is used as a sizing and in certain food preparations and industrial application.

While the bulk of the chemical is used in food and industrial purposes, the Government, in the National Defense Program, is using it in "creaming" rubber solids from the latex or sap of the rubber tree. Another use is in the preparation of ice cream for the Navy where it replaces gelatine. It is also used widely, but not in any great volume, in the preparation of chemicals and drugs.

Yard Notes

At a pretty twilight ceremony, the new Mexican patrol boat Halcon was launched August 20 at the plant of the Harbor Boat Works in San Diego. Señora Carlos Santibanez, wife of the director of the Department of Revenue in Mexico City, was the sponsor. The Halcon is an 83-footer with a beam of 15 feet and, built of wood, resembles the U. S. subchasers of the last war. Two 450-hp Superior diesel engines will give the vessel a speed of about twenty knots. Manned by a crew of 16, the vessel will be stationed at Ensenada and will be used by the Mexican Navy in coast patrol work. She mounts two machine guns, one forward and one aft. It is planned to build two or more similar vessels at this yard and, due to the necessity of moving the yard for the Harbor Drive development, a new site is being located for the plant.

Another San Diego launching was that of the tuna clipper St. Ann on August 30 at the Martinolich yard. Built to the order of Manuel Machado, Joseph Machado and Cecil Drake, the St. Ann is a 103-footer with a beam of 25 feet, and capacity for 160 tons of fish. Propelling power will be a 465-hp Superior diesel and the completed cost of the boat will be about $132,000.

The Martinolich Shipyard plans to lay the keels immediately for another 103-foot tuna boat for Frank Perry, to cost about $135,000, and for two 135-foot boats to cost about $250,000 each, both for Manuel Rosa.

At the Campbell Machine Company, San Diego, two tuna boats are in frame and partially planked but work is being delayed by the difficulty in obtaining materials, particularly metal parts. Due to Government priorities, it is next to impossible to get bronze tail shafts and steel is being substituted to hasten completion, but both boats are now about two months behind delivery schedule.

The Campbell yard is also rebuilding the steel dredge Alamitos, which foundered in the bay at North Island August 3, and are to lengthen the vessel twenty feet.

The San Diego Marine Construction Company has laid the keel for Star and Crescent's new tug San Miguel and has four Navy patrol boats in frame and partially planked.

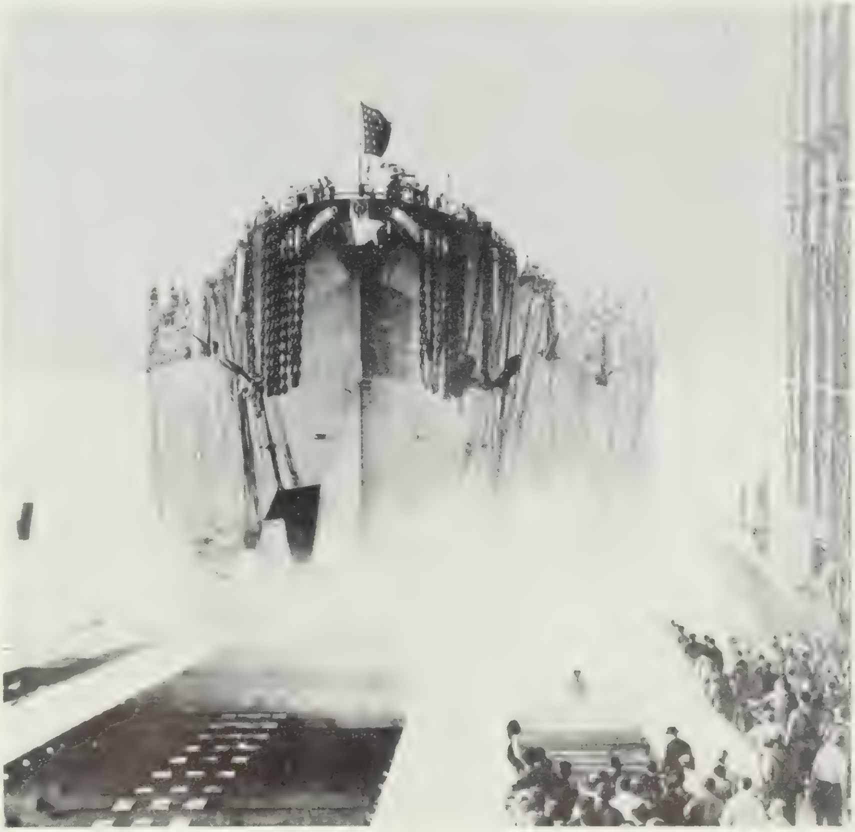
Personalities

Alexander Korol, manager of the Hawaiian Tuna Packers, Ltd., was a recent visitor to San Diego and purchased the tuna clipper Santa Ines from Capt. O. J. Hall, Joaquin Fernandes and James Tregilgas. The ship was thoroughly overhauled and made a ten-day run to Honolulu. The 82-foot vessel is the first of the refrigerated boats to base in the island port.

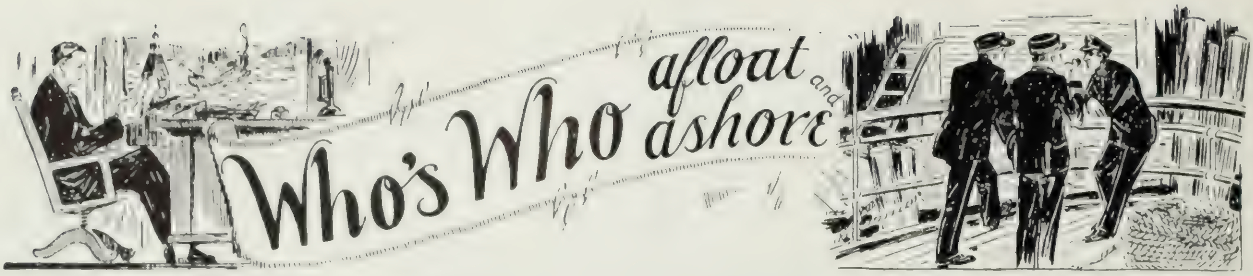
C. A. Hodgman, traffic manager for the port of San Diego, returned to his post early in September after attending in a meeting of the California Port Authorities in San Francisco.

Capt. Jay Wilsey of the schooner yacht Ruana reports taking some excellent pictures of the seal herds on Guadalupe Island and other sea life, which are being sent to the American Museum of Natural History in New York. The Ruana is to return to Santa Cruz and obtain underwater pictures in depths up to 20 feet of submarine flora and fauna.

Capt. Joe Marques of the clipper Normandie reports an eventful 11-week trip to the Galapagos Islands on their recently completed voyage. To save the life of Beverly Spilmer, radio operator, the Normandie made a full speed dash from the Galapagos, escorted by an American destroyer, to Panama. Spilmer, who was suffering from pneumonia, was attended by the warship's doctor and removed to the hospital at Balboa on arrival at the canal port. Unusually severe restrictions were found being imposed by officials at Panama and no member of the crew was allowed ashore until his fingerprints had been checked and citizenship verified. Returning to the Galapagos, the Normandie continued fishing and had an encounter with a large whale shark which became inquisitive and got afoul of the propeller. The encounter almost stalled the engine and caused a vibration which persisted the rest of the voyage. Arriving at San Diego, the boat discharged 400 tons of tuna and went on drydock for examination.



Launching one of our own new battleships



Who's Who afloat and ashore

Edited by Jerry E. Scanlon

Ship Personnel

The steamer George L. Olson has O. A. Johnson as master, relieving D. M. Nielsen. On the bridge of the Coos Bay is Captain John Allen, replacing Edward Buckner. The steamer Anna Schafer is commanded by O. A. Hana; vice, Captain Bernard Butzing. The tanker Paul Shoup is commanded by R. W. Kelly, who relieved Captain M. Melan. Captain Karl Rosenbald has been named master of the steamer Alvarado, replacing Captain John Lund. The Matson freighter Maunawili is skippered by T. H. Cunningham, who relieved Captain Arthur Jenseon. Captain C. A. Berndtson, one of the best known Matson passenger navigators, is shoreside from the Lurline with the return of Captain H. R. Gillispie. Captain C. H. Wickman is master of the freighter Mahimahi, replacing K. L. Svending.

The fine new cargo carrier American Press, built at the Western Pipe & Steel Company's ways and christened in tribute to the Fourth Estate, is in command of Captain John W. Anderson, who assumed regular command after the trial runs were navigated under Captain J. M. Tooley.

Appointment of Ray V. Winquist as Vice-President in Charge of Traffic was announced recently by General Steamship Corporation, Ltd., through Harry S. Scott, its President. Mr. Winquist has been associated with the company for the past fifteen years. During the last several years he has acted as General Traffic Manager. He will continue in active charge of freight and passenger traffic, with headquarters in San Francisco. Prior to his joining the staff of the General Steamship Corporation, Winquist was connected with the operation of government-owned vessels, having served in Washington, D. C., Europe and South America. During the last world war he served in the Navy Department and subsequently with the War Industries Board at Washington, under the direction of its chairman, Bernard M. Baruch.

Lunny

Joseph A. Lunny, vice president of Pope & Talbot, Inc., McCormick Steamship Company, who has just returned from New York and Washington, reports that national officials and heads of the Propeller Club of the United States and the American Merchant Marine look forward to the Fifteenth Annual Convention in San Francisco, starting October 21, as a "red letter day" in the maritime industry of the United States.

Never before, he said, have this nation's shipping leaders shown such unity as to agree on a long-range post-war program to protect this country's shipping and shipbuilding. To this end, they are approaching their meeting in San Francisco with the deepest consideration to all problems affecting and likely to confront the maritime industry.

Mr. Lunny, in cooperation with John T. Greany, sales manager for the Bethlehem Shipbuilding Corporation, Ltd., has completed details for the annual match play at Lakeside for the perpetual cup of the Propeller Club.

Charles Dow, who is as well known in most ports of the world as he is in his home town of Puyallup, Washington, has been transferred as chief engineer on the McCormick Steamship Company's West Nilus to the S.S. Hollywood.

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Frank Seryanivich has been appointed chief engineer on the West Camargo, another McCormick Line carrier, replacing C. O. Palmer.

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The arrival here of the new liner

Capt. William Weaver

President Van Buren on October 6 was the occasion for a welcome to the vessel by shipping interests, and of hearty greetings to Captain William Weaver, veteran in point of years in the transpacific service and the American President Line's around-the-world service. His last command was the S.S. President Cleveland.

Captain Weaver brought word that the President Polk, a sister ship and last of the seven vessels of this type built for APL under Maritime Commission auspices, at press time was scheduled to sail from New York for the Pacific Coast on October 12.

The deck and engine room personnel serving under Captain Weaver includes: Michael "Mike" Doyle as chief engineer. He was formerly chief on the President Hayes. First assistant is Patrick McCoy and second assistant is E. Spark.

Under Captain Weaver are F. J. Llanso, chief officer; C. B. Gjedsted, first officer; P. V. Parker, second officer; J. Felmas, chief steward, well known and popular in Pacific Ocean cuisine ranks with his shipmates and the traveling public, as is D. C. Heister, purser.

Command Changes

Among changes in commands of well-known Pacific Ocean operated vessels at press time were the following:

Captain L. A. Carlisle succeeded Edward Hardwick on the S.S. Arizonan; Captain John Bostrom succeeded O. J. Carlsen as master of the steamer San Diego; Captain Carl Carlson is now on the bridge of the steamer Barbara Olson; vice, Captain B. Carlsen; the tanker M. E. Lombardi is in charge of Captain C. S. Sullivan, who replaced R. M. Melbye; Captain F. E. Waite of the steamer Camden shifted commands with Captain L. A. Nixon of the S.S. Antietam. The steamer Dakotan is now under Captain L. E Thomson, who replaced Captain F. Bain.

Hugh B. Robinson, district manager of the United States Lines for France and Southern Europe for twelve years preceding the outbreak of the war, has been appointed special assistant to Captain F. G. Reinecke, U. S. N., naval port director at New York, with headquarters at 17 Battery Place. He has been given leave of absence from his shipping post to accept the new position.

C. M. "Dad" LeCount

Schenectady Trip

Against the protests of one of the grand figures of the Pacific Coast's maritime fraternity, we are announcing that C. M. "Dad" LeCount, who is in charge of all marine and Government sales for the General Electric, is heading East for Schenectady to confer with Eastern officials. Prior to his leave-taking, he was tendered a testimonial dinner by leaders of the Pacific range shipping and engineering groups.

The tribute to "Dad" LeCount was an appreciation of the regard in which he is held, and for his tireless efforts to further the so successful annual convention of the Propeller Club of the United States and the American Merchant Marine Conference.

"Dad" had the all important post as treasurer. Year by year—and he has been identified here with General Electric for the last 30 years—the genial, quiet manner and refreshing personality of "Dad" adds new friends and business contacts.

It may be revealed to those who don't know, that "Dad" has been with G. E. ever since he was graduated in electrical engineering from Stanford University. He is a friend of former President Hoover. We might also say that "Dad" was born in South Dakota, that he married shortly after college days, has two sons, both married, and that the family home is in Berkeley.

Capt. Leighton Robinson

Robinson, Rylander, Waring

In the short outline we are giving herewith about three figures, two of them well-known and high in the esteem of the Pacific range shipping world, the other as popular on the East Coast, and now here with our prediction that he will attain the same status among West Coast marine interests.

First, we record that Captain Leighton Robinson has retired after thirty years' service in the San Francisco headquarters of the United States Shipping Commissioner's offices; secondly, Captain John A. Rylander, Shipping Commissioner in this office since 1932, has been called back to service with the Navy as lieutenant-commander, and his successor is Stuart H. Waring, transferred from the New York offices.

We could fill this issue about the colorful career of Captain Robinson. He is now seventy years of age, and was born in Cornwall in October, 1871, whence he was taken to Falmouth. He first gained marine experience at "The Conway" as a cadet stationed in the Mersey, then as an apprentice he went to sea, his first voyage being in the "Swansea Wales," which went to San Francisco, in 1888. This was a voyage of 130 days. He then sailed on such famed ships of forty to fifty years ago as the full-rigged ship Crown of Denmark and the Ben Lee. It was while chief mate on the latter vessel that he came in through the Golden Gate near death from typhoid. He was taken ashore and brought to St. Mary's Hospital. This was in 1897.

Captain Robinson elected to remain here. He joined Goodall and Perkins and sailed on the S.S. Santa Rosa under Captain E. Alexander. Then he shifted to the "hog boats" as officer on the State of California, operating coastwise. Later he transferred to another concern, the famed O. & O., and was assigned to the Coptic in transpacific service, remaining in this berth until he was offered command of the bark Melanope.

After several years as master of sailing ships, he decided to land a shoreside berth. He was appointed superintendent of the Shipowners' Association of the Pacific Coast, at the time when the late Governor Rolph was president of the firm. Later he became interested in the lot of sailors. At the time, marine union affairs along the San Francisco front were pretty much handled by Andrew Furuseth, Walter Macarthur, John Kean, Ed. Erickson, E. Ellison and "Paddy" Flynn. They, recounted Captain Robinson, were the then real union leaders on San Francisco's waterfront.

John A. Rylander

Captain Robinson decided to enter the Federal service. He qualified, and was appointed under Deputy U. S. Shipping Commissioner Thomas Murphy, and when the latter died, Captain Robinson was named to this post, a position he so ably and faithfully discharged until his retirement on September 15 of this year.

From now on Captain Robinson,

●

New Shipping Commissioner Stuart H. Waring

●

who resides in Mill Valley, will continue his interest in shipping, and will devote more of his time to yachting. He is a valued member of the San Francisco Yacht Club, and may be found "sailoring" around the boats at Sausalito most any day.

The return to sea duty with the Navy of Captain Rhylander closes an association with the Shipping Commissioner's office for the period of the emergency, at least, which started in 1929, when he was named shipping commissioner in San Pedro.

He had been master of a number of vessels in the American merchant marine before 1929, and was named head of the Shipping Commissioner's office in San Francisco in 1932.

Succeeding Captain Rhylander is Stuart H. Waring, since 1923, and until his arrival here at the end of September, identified with the New York office as deputy and chief deputy until ordered to San Francisco.

The first and last time, until his recent arrival, that Mr. Waring, who is also a former Naval Reserve and merchant marine officer, was in the Port of San Francisco was in 1914, when he came ashore on New Year's eve from the U.S.S. Proteus, and then hurriedly had to rejoin his ship when word was flashed that a serious slide had blocked the Panama Canal.

Mr. Waring reported that he had sold his home in Huntington Heights, N. Y., "lock, stock and barrel". He is residing with Mrs. Waring and their son, Laurence, in Burlingame.

CMA Executive

In the near future, if there should arise a contest for an American, symbolic of all that is desired in a merchant marine officer, we are going to present the name of Captain B. M. Dodson, executive officer of the California Maritime Academy's training ship, California State.

Backed by fifteen years of sea training, and beginning as a deckhand for the old California & Eastern Steamship Company in 1926, Captain Dodson today is regarded by officers and cadets as one of the best executives ever produced by the American merchant marine or any other maritime institution.

Capt. B. M. Dodson

A brief sketch of his career is presented:

In 1926 he joined the California & Eastern as deckhand, two years later joining the Navy; in 1929 he received an appointment to the Naval Academy; in 1930 retired from the Naval Academy to re-enter the merchant marine; entered the United States Lines in 1930; then went to the old Dollar Steamship Line, serving as junior and senior officer on such vessels as the President Hoover and the President Coolidge.

Captain Dodson in 1936 secured an appointment as officer and instructor in the California Maritime Academy. From this time until the present, with the exception of twelve months on leave to serve as a naval officer on the U.S.S. Vega, he advanced through the various grades.

He is co-author of "Mathematics for Navigators," published by the Naval Institute and used by the majority of merchant and naval reserve officers, and was in command of the South American cruise of the California State the past spring.

Meet Lonnie Owens!

A short sketch of the life and activities to date of a very retiring but esteemed member of the Pacific Coast shipping fraternity is presented.

The subject is Alonzo J. "Lonnie" Owens, operating manager for Sudden & Christenson under President Arthur B. Cahill. It was no easy matter persuading "Lonnie" to give a short history of his career.

We knew something about him, as we had enjoyed an acquaintance with his father, the late William J. Owens, who was for so many years identified with the old Spreckels Company, later the Oceanic Steamship Company, as superintendent in the days of the beloved Fred S. Samuels.

In 1912 "Lonnie" was graduated from Cogswell High School. He made a detour when his family tried to persuade him to go to college. He wanted to go to sea. Fred Samuels helped him in his argument, as "Lonnie" had made several trips in the Spreckels ships during school vacations.

Alonzo "Lonnie" J. Owens

With his school career behind him, he went to work for J. D. Spreckels Bros. Co., owners and steamship agents. During this time he secured invaluable experience afloat and ashore, as he served on deck and in the purser's and engineering departments. Later he went shoreside and joined the freight department, handling cargo bookings, and later became assistant freight cashier.

Then came the war. "Lonnie" enlisted in the U. S. Naval Reserve and served shoreside and afloat as assistant paymaster. In 1919 he was mustered out and entered the offices of Sudden & Christenson. Shortly thereafter he was named operating manager, the position he now occupies.

He is the father of two boys; his eldest, Robert, 21, graduated from the

California Maritime Academy in May of this year and is now third mate on the S.S. West Camargo of the McCormick Steamship Company. His youngest is Warren, 15, a student at San Mateo Junior High. Mr. Owens was married in 1917 to Miss Mae McAllister.

"Lonnie" inherits not only his father's but his grandfather's love for the sea and things maritime. His grandfather, Robert J. Owens, was a pioneer in this country's merchant marine service.

Three men, who have all established records of ability as marine leaders, stand out as helping him during his early sea career. They are Captain Al Thomson, member of the California Bar Pilot's Association; Captain W. G. Tibbetts, head of the local U. S. Inspection Bureau; and the late Milton "Milt" Towne, one of the Pacific Ocean's great engineers.

Most important is his family, after which his chief interests are his work; the Propeller Club, of which he is vice chairman of the Transportation Committee arranging for the National Convention; and the California Maritime Academy.

Impresario!

Robert D. Spear

Robert D. Spear, Pacific District manager for Foster Wheeler Corporation, if he ever desires to make a change in occupation and be an impresario, is a sure bet to equal his success in his present business, fellow members of the Propeller Club of the United States will attest.

"Bob" is handling all the fine entertainment details for the annual convention of the Propeller Club of the United States and the American Merchant Marine. We might add here that Mrs. Spear is doing an equally notable job as vice chairman under Mrs. Charles L. Wheeler, handling the womens entertainment. Seems to run in the Spear family, this entertainment flair.

A few details of his early career, include being born in Yonkers, N. Y., going to New York City schools; and graduating from Cornell University in 1918, when he was handed his degree as mechanical engineer. Then he took a marine engineering course, and placed high in graduation class. Then to the United States Navy Engineering School for further knowledge in the mechanics of engineering. He was commissioned an ensign in 1919, and shortly thereafter left the Government service to become identified with the Condenser Engineering Co. in Carteret, N. J. He was head of the evaporating and heating department of this well-known concern for several years. Then he came to California for his present employers in 1929 as sales engineer.

The engineering interests recall that Foster Wheeler Corporation is the successful outgrowth of a merger in 1927 between Wheeler Condenser & Engineering Co. and the Power Specialty Company.

It was in 1938, after serving Los Angeles for a year and returning to New York to spend three more years, that he came to San Francisco to occupy the present position, whose duties he so ably discharges. He is an active member in the Propeller Club of the United States, Port of San Francisco; the American Welding Society; and the Engineering Club of San Francisco.

During his college days, Mr. Spear wore the Cornell colors in track and field events, but is best known among college men of that era for his fast stepping with cross country teams, the mile and two-mile events.

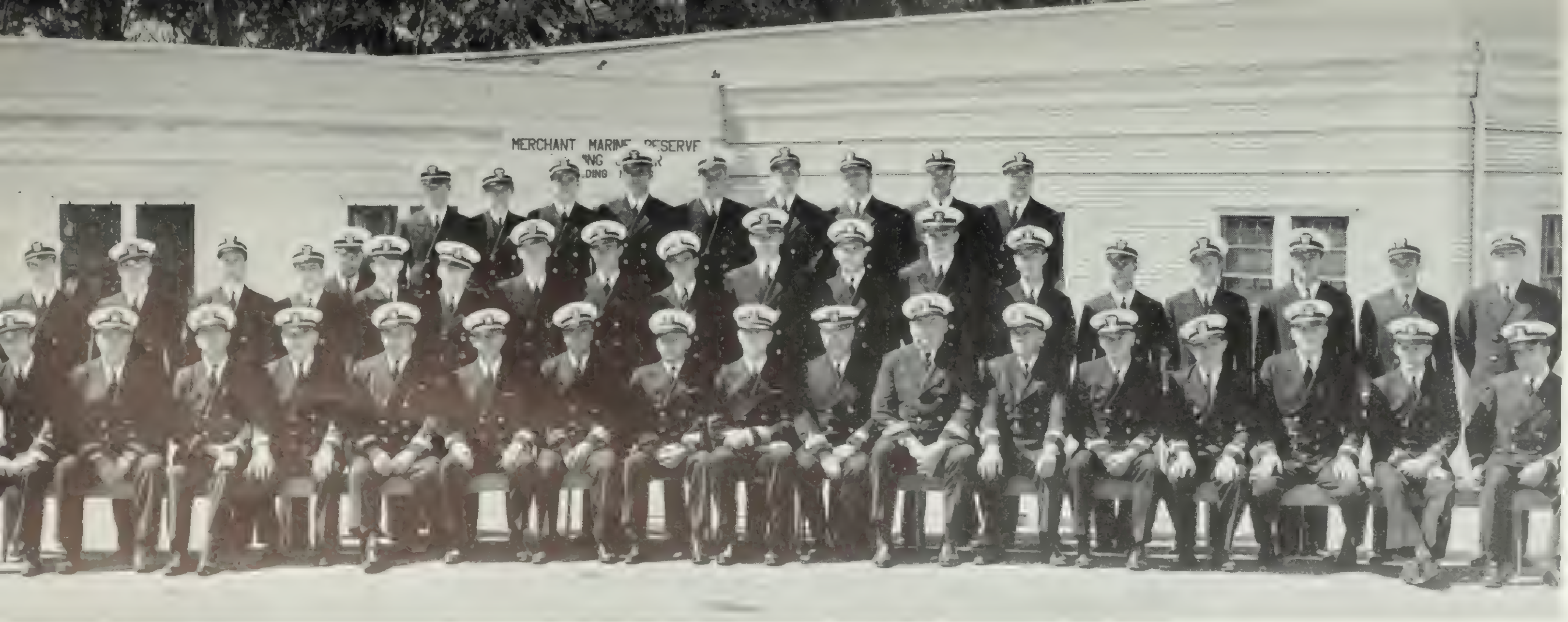
George Barr Is Back

The sparkling wit and humorous stories of George Barr will again enliven gatherings of the marine fraternity at the Port of San Francisco after an all-too-long absence of three years. The genial Scot, whose anectdotes are the piece de resistance in any entertainment group, has completed the mammoth job of installing four large turbine generators for the Pacific Gas & Electric Company.

Now the marine superintendent for this concern returns to his old job on the San Francisco waterfront, where he will supervise the General Electric equipment on a large number of new ships, both merchant and naval.

Mr. Barr came to San Francisco about 23 years ago to oversee the installation of turbine gears on forty-six destroyers at the Union Plant of Bethlehem. From then on, he renounced any allegiance to any other part of the world. Since World War No. 1, he has been looking after all the marine turbine work in the Pacific area. He made the shakedown cruise on the liner

George Barr



HESE U.S.N.R. OFFICERS, WELL KNOWN TO COAST MERCHANT MARITIMERS, WERE PHOTOGRAPHED RECENTLY BY P.M.R.'s STAFF PHOTOGRAPHER

ottom row (left to right): H. E. Halterman, Ensign, Grace Lines, D-M USNR; E. F. Davis, Lieut. (jg), Sudden & Christenson Lumber Co., D-M SNR; J. E. O'Brien, Lieut. (jg), Standard Oil Co., D-M USNR; R. G. Wilson, Lieut. (jg), American President Lines, D-M USNR; E. W. Glines, ieut., California State Nautical Schoolship, D-M USNR; G. E. Ely, Lieut. Comdr., General Petroleum Co., D-M USNR; D. E. Collins, Lieut. omdr., American President Lines, D-M USNR; J. H. Falge, Lieut. Comdr, USN (ret.), Communications Instructor MMTRC; P. W. Northcroft, ommander, USN (ret.), Senior Instructor MMRTC; F. P. Brewer, Lieut. Comdr., USN (ret.), Gunnery Instructor MMRTC; W. K. Kjeldsen, ieut. Comdr., D-O, USNR; O. Salo, Lieut., Pope & Talbot Co., D-M USNR; R. C. Willson, Lieut., Matson Nav. Co., D-M USNR; W. F. Bentley, Lieut. jg), American Hawaiian S.S. Co., D-M USNR; S. E. Jorgensen, Lieut. (jg), Texas Co., D-M USNR; H. F. Hawk, Ensign, D-V (G) USNR; F. L. ee, Ensign, D-V (G) USNR. *Second row*: E. M. Larson, Ensign, D-V (G) USNR; R. E. Lewis, Ensign, D-V (G) USNR; R. E. Green, Ensign, D-V G) USNR; C. M. Borwick, Ensign, D-V (G) USNR; R. D. MacMorran, Ensign, D-V (G) USNR; F. B. Foulgar, Ensign, D-V (G) USNR; D. A. ee, Ensign, D-M USNR, Union Oil Co.; R. W. Lamka, Ensign, D-V (G) USNR; T. R. Hopkins, Ensign, D-V (G) USNR; J. S. Bailey, Ensign, -M USNR, American President Lines; J. C. Barnes, Jr., Ensign, D-V (G) USNR; J. M. Krenz, Ensign, D-V (G) USNR; W. D. Henderson, Engn, D-V (G) USNR; E. N. Chase, Ensign, D-V (G) USNR; H. Severin, Lieut, D-V (S) USNR; A. H. Branson, Ensign, D-V (G) USNR; J. C. allup, Ensign, D-V (G) USNR; D. W. Gaston, Ensign, D-V (G) USNR; R. J. Jackson, Ensign, D-V (G) USNR; E. J. Boyd, Ensign, D-V (G) SNR. *Third row*: C. L. Heaton, Ensign, D-V (G) USNR; L. D. Dawes, Ensign, D-V (G) USNR; W. K. Rummel, Ensign, D-V (G) USNR; Z. T. elm, Ensign, D-V (G) USNR; R. W. Benner, Ensign, D-V (G) USNR; M. B. Jackson, Ensign, D-V (G) USNR; R. C. Ness, Ensign, D-V (G) SNR; W. V. Harlin, Ensign, D-V (G) USNR; E. L. Folsom, Ensign, D-V (G) USNR.

President Hoover, his longest sea trip from his "adopted" port in many years.

Some idea of how he is regarded outside the "G. E." ranks is attested by the Navy Department's asking him to make the test trips on the destroyers Smith, Preston and Henley, which were built at Mare Island. He went to Australia on the Preston and returned to Vallejo on the Smith.

Born in Paisley, Scotland, Mr. Barr learned his business on the Clyde, or, rather, as he expresses it, "Started to learn something about engineering." He served as chief engineer on the ships of the British Indies Lines. Then he came to the United States and became affiliated with the Schenectady headquarters of General Electric, where he remained until sent to the Pacific Coast.

* * *

If fealty to duty and indefatigable work is the key to success, then the Fifteenth Annual National Convention of the Propeller Club of the

chant Marine Conference will shatte all previous records when it comes t a close in San Francisco on Octobe 24, after being in session since th 21st.

To single out any one person amon the San Francisco committee would b unfair. Likewise, the part the Women Committee is playing approaches s close to that of their husbands tha it suffices to announce that neutra shipping leaders state that never i past years has there been displaye such enthusiasm, unity of purpos and intelligent approach to such momentous gathering of ship opera tors and shipbuilders as has and being displayed by the Propeller Clu of the United States, Port of Sa Francisco.

* * *

Now that Vladivostok has come t the front as the Pacific "life-line" fo transit of vital war and food material for the Russian armies and the Soviet population. Pacific Coast ports are th loading centers for more of that coun try's merchant marine than ever be fore in history.

For the last twenty years, the ap pearance in a Pacific Coast port of Soviet ship was occasion for first pag news and much speculation. Its officer and crew, many times numbering wo men, were the subject for press inter views.

* * *

Seagoing friends and acquaintance learn that Walter S. Wheaton, retired had just celebrated his 71st birthday He is remembered as having operated in the coastwise trade and engaged i lines in the transpacific business.

Mr. Wheaton has been out of bus iness for the last five years, making hi home in Arcadia. He reports that h makes annual "voyages" to the Marin Exchange to keep his contacts wit nautical matters.

The twenty-eighth annual meeting of the Pacific Coast Association of Port Authorities was held in Seattle, Washington, where R. H. Van Deman of San Diego was elected the new president, succeeding K. J. Burns, Vancouver, B. C.

The vice presidents elected were M. H. Gates of San Francisco and S. H. Marvin of Tacoma. J. W. Brennan of San Diego was chosen as secretary-treasurer. The directors were named as follows: James J. McElroy, Oakland; Colonel B. C. Allin, Stockton; George H. Moore, Los Angeles; D. Lamport, Long Beach, and K. J. Burns, Vancouver, B. C.

* * *

G. H. Nickerson, general passenger agent of the United States Lines at Los Angeles, announced early in September that his company had been appointed to represent the American South African Line, Inc., as General Passenger Agent.

To their present fleet, which plys between New York and Capetown, South Africa, the American South African Line will soon add three C-3 cargo-passenger steamers, according to Mr. Nickerson. The vessels, now building, will accommodate 116 passengers each.

* * *

As announced in September, the Lykes Bros. Steamship Company have renamed the steamship services operated or controlled by them to the following:

Lykes Continent Line.
Lykes Mediterranean Line.
Lykes West Indies Line.
Lykes Orient Line.
Lykes U. K. Line.
Lykes African Line.

* * *

Late in September, word was received in San Francisco that Thomas Arthur Lee, formerly Pacific Coast manager of the Furness Line, died in Sydney, Australia, at the age of 58.

* * *

Robert Seely joined the Robert Dollar Company the first of October. While the transfer of "Bob," as he is known among men afloat and ashore, came as a surprise, it is another step upward in the ladder for the popular former official of the American President Lines.

Capt. Blackstone

Sailormen in off-watches and ashore are given to reminesence, not about their hardships and the adventures that are part of the lives of these men, but rather about this and that shipmate or officer.

We venture to say that when the name of Captain Henry Blackstone is mentioned there is always someone who recalls some deed or kindness that this tall, quiet, commanding figure of the sea has performed in his unassuming way.

Over a period of some time, in driblets, we learned the following about Captain Blackstone:

He was born in Pittsburg, Pennsylvania, June 22, 1887, and received his preliminary education in the public schools, then went through Bethany College in West Virginia. Penn Nautical School was his next seat of learning, where he was graduated in 1906.

Capt. Henry Blackstone

That Captain Blackstone took to the water like the proverbial duck may be vouchsafed by the fact he had his master's ticket for any ocean at the age of 25. He served in the Lighthouse Service from 1908 to 1917.

It was early in the start of the war that Captain Blackstone as a lieutenant in the Navy, joined the "suicide fleet" operating out of Brest. Later he was on destroyers in the war zone, afterwards going into the U. S. Transport Service commanding vessels being returned to companies which had been doing war service.

In 1922 he joined the United States Shipping Board and was stationed in the Baltic in charge of maintenance and repair until 1926, when he returned to this country to take a berth with the Atlantic Refining Company. Later he handled Export Line vessels plying to the Mediterranean and Near East.

His sea career continued until 1929, when he joined the newly-formed Accident Prevention Department of the United States Protection and Indemnity Agency, Inc., in New York, three years later being transferred to San Francisco to assume charge of West Coast activities.

In this berth he has been contented, and all his San Francisco friends hope that he may remain here, but with the emergency arising, Captain Blackstone may again be on a rolling deck backing up President Roosevelt's warning to Hitler about the "Freedom of the Seas."

In the interim, the activities of Captain Blackstone are in the Army and Navy Club and his duties as vice chairman of the Banquet and Hotel Committee for the Fifteenth annual gathering of the Propeller Club of the United States and the American Merchant Marine this month.

* * *

The Chilean Line's President Carlos A. Vial was in New York in September to confer with company officials in the United States regarding the travel situation and the expansion of offices. He may tour the Pacific Coast to further his studies.

* * *

Gerald A. Glasscock, foreign trade counselor of the Los Angeles Chamber of Commerce, will conduct a class of discussion on "International Relations and Foreign Trade," meeting each Tuesday and Thursday evenings at the Metropolitan School of Business, Los Angeles, according to the principal, Henry Orlo Backer.

Ship Allocations

The Maritime Commission has adopted a policy of giving preference to American steamship operators and owners who have cooperated with the development of the American merchant marine in the allocation of vessels in a given trade route, Rear Admiral E. S. Land has informed E. C. Mausshardt, district manager, Pacific Coast District.

Since taking over former Danish, Italian and German vessels, this has been the Commission's policy. Now it is being extended to cover approval by the Commission of charter of consignment of vessels in trade routes normally served by U. S. flag owners and operators who have been engaged in defined trade for a period of years. Pacific Coast companies will be favored under this policy, as many have been, at great losses, engaged in stiff competition with the other nations of the world until shortly after the outbreak of the present war. Tonnage, the Commission announces, will be allocated to operators who qualify under the following categories listed in order of priority:

(a) Companies who have constructed and operated owned U. S. flag vessels under the Merchant Marine Act of 1928 or 1936 or prior thereto.

(b) Companies who have owned and who have operated owned U. S. flag vessels prior to September 1, 1939.

(c) Companies who have owned and who have operated owned U. S. flag vessels prior to April 9, 1940.

(d) Companies who have acquired American flag vessels recently or who subsequently acquire American vessels and operate their own U. S. flag ships which have recently been acquired either as their total operation or in conjunction with other foreign flag operations.

New Models at Museum

Newest acquisition to the Marine Exhibit of the San Francisco Museum of Science and Industry, at Aquatic Park, is a valuable old print of the S.S. John L. Stephens, given by the J. D. and A. B. Spreckels Company.

Three of the Wilmington Transportation Company tugs handling docking of the U. S. Lines America when she visited Los Angeles Harbor early this year. In addition to these three tugs, the company has six additional ones, bringing the fleet up to a total of nine tugs. Horsepower range is from 150 to 600. . . . We are indebted to Carl F. Fennema, general manager of the Santa Catalina Line, for dropping this photo into the mails just before leaving for the Propeller Club Convention.

Built for the Pacific Mail Steamship Company in New York in 1851, the John L. Stephen was a 2500-ton paddle wheel steamer of the American type, and was the first two-stack vessel to ply between the East and San Francisco. One stack was forward and one aft of the walking beam. It was large, fast and commodious; one of the finest passenger ships of its day.

The John L. Stephens made its first trip to San Francisco in 1853. The San Francisco Daily Herald of April 4, of that year, states "The Pacific Mail Steamship Company's new steamer, John L. Stephens, Captain R. Pearson, arrived at an early hour yesterday morning, in 15 days from Panama, carrying 544 passengers."

It is interesting to note that among the passengers were listed "C. Spreckels, wife and infant." This was Claus Spreckels, founder of the great sugar business in California and father of the late J. D. and A. B. Spreckels, whose company presented the picture to the Marine Museum.

A model of the Fort Sutter has been donated by the River Lines through N. A. Fay, vice-president and general manager. Originally built at a cost of approximately $6,000, the Fort Sutter is a perfect working model of the stern wheeler type of river boat that ran between San Francisco and Sacramento.

Mrs. H. W. Lewis, of San Francisco, has presented a model of the Kronprinzessin Cecile. During the first World War this ship was taken over by the United States Government, and renamed Mt. Vernon and used as an army transport.

Mrs. W. C. Edwards, of San Francisco, has loaned the Museum a picture of the Golden Gate by Coulter and has also loaned models of a Dutch fishing boat and a Dutch fishing steamship.

From Mrs. Irene C. Coleman of Rock Port, Maine, has come the first original copy of the Coast Seamen's Journal printed in San Francisco on November 2, 1889.

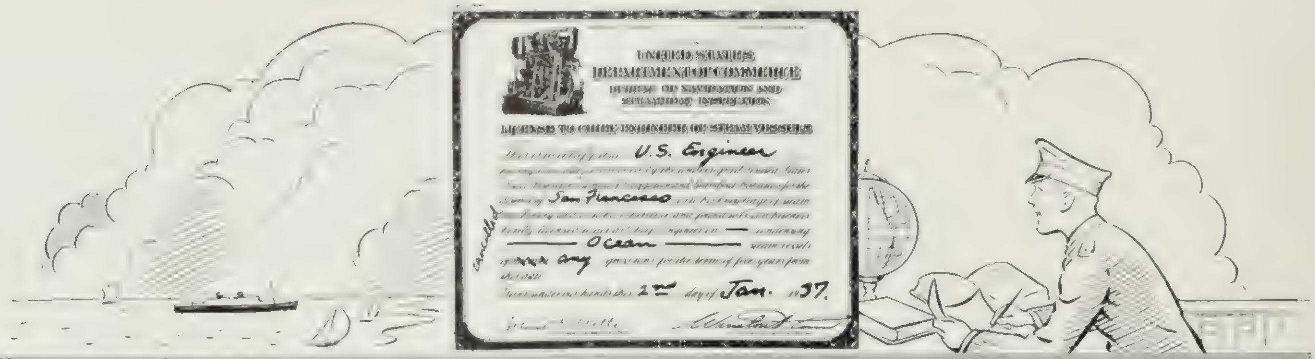
An additional room has been provided by the Board of Park Commissioners for the Aquatic Park exhibit, and will be opened to the public soon, according to Walter J. Walsh, president.

Since the Marine Exhibit was opened last May, approximately 60,000 have visited it. The exhibit is open daily, except Monday, from 10:00 a.m. to 4:00 p.m. There is no admission charge.

Leo Archer in S. F.

On Wednesday, October 1, Moore-McCormack Lines, at 200 Pine Street, took over their own general passenger agency, heretofore handled by the United States Lines.

This announcement was made by **Commander K. H. Donavin,** Pacific Coast manager, Moore - McCormack Lines, at a cocktail party given at the Commercial Club in honor of **L. E. Archer,** general passenger traffic manager, who is in San Francisco on vacation. Attending the reception were some hundred travel agents from Northern California to welcome Mr. Archer.



Your Problems Answered

by "The Chief"

"The Chief's" department welcomes questions—Just write "The Chief," Pacific Marine Review, 500 Sansome Street, San Francisco, California

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LETTERS FROM THE SHIPS

QUESTION

Dear Sir,

Many thanks for answering my question relative to putting the evaporator vapor directly into the main condenser instead of into the auxiliary exhaust system. But I fear that I have not made my problem clear, and, since you invite further comment, I am writing once again.

I agree that we should try to get all the available mechanical energy out of this evaporator-made steam before condensing it, thus regaining part of the energy given up from the live or bleeder steam used in the evaporator. But since the prevailing conditions are such that the supply and demand on the auxiliary exhaust are rather well balanced, the auxiliary exhaust valve to the main condenser must be opened some to allow extra steam to pass when the evaporator is started and the vapor put into the auxiliary exhaust.

Then, the problem arises of whether to allow the back pressure to remain at its normal operating point of 12 to 14 pounds or to lower the back pressure to the neighborhood of seven pounds by opening the auxiliary exhaust valve to the condenser. In the first case, the feed water heater would be kept at its proper temperature, but a pressure of 12 to 14 pounds would be impressed on the evaporator vapor line, with a corresponding boiling point of from 243 to 247 degrees Fahrenheit. In the second case, the boiling point in the evaporator would be in the neighborhood of 232 degrees; but, in order to effect the proper temperature on the feed water, it would be necessary to add live steam to the surge tank.

So, it seems apparent that the evaporator vapor is put into the auxiliary exhaust merely because this device offers a convenient method of getting it into the system where it will be condensed. It may then be transferred and used where needed.

Now, why not carry the evaporator up through a pipe thirty feet high and then down to the condenser with its low absolute pressure? Assuming a pressure of say one pound and the corresponding boiling point of 101.7 degrees, it would be possible to make from two to three times as much water from the same heating steam. Of course, the available energy in the evaporator vapor would be wasted, but is it not wasted anyhow? And is not the energy in the live or bleeder steam used in making the water in the evaporator boil under the prevailing high pressure wasted in addition?

Thanking you for any comments,

H. H. G.,

ANSWER

This letter asks two questions in the last paragraph: (a) Why not use 30-foot pipe running vertically? (b) Is not the energy in steam used for evaporators wasted any way we figure it?

(a) As indicated in the letter, when vapor from evaporators is turned into auxiliary exhaust line, there is more steam in the line than can be used by heaters and it is necessary to relieve this line into the main condenser.

If the amount of steam relieved from the auxiliary exhaust into the main condenser is equal to the amount of steam generated in the evaporators, then the condition is exactly the same as though we were to turn the evaporator directly into the main condenser without going through the auxiliary exhaust line; and, in addition, as the writer says, it would be better to turn the evaporators into the low pressure of main condenser because of the increase in water evaporated at the lower back pressure. The question reduces to whether we shall hold a 27-pound (12+15) absolute pressure on evaporators or a one-pound absolute pressure. By all means, hold the lowest back pressure on evaporator possible. It would be better to reduce the steam exhausted into the auxiliary exhaust line and let the evaporators discharge into it. This might be done by manipulation of the auxiliaries in such a way that they use less steam, but we assume that the best combination of auxiliary use has been made and the exhaust cannot be reduced. The writer's assumption is correct and he may as well discharge directly into the main condenser.

He may not be able to make as much more water as he expects, as the evaporator cannot evaporate much beyond its designed limit. The 30-foot vertical pipe would prevent some carryover, but steam at one-pound pressure occupies so much volume that redesign of piping would be necessary, and a larger evaporator.

"The Chief" suspects that the writer has selected the length of 30 feet vertically as being more than a vacuum will lift a column of water from atmospheric pressure. If so, this is a mistake. It is true that the condenser would not lift a column of cold water more than 25 to 28 feet if the water was subject to atmospheric pressure in the tank. But, if more than atmospheric pressure were available, the column would rise higher.

In this problem, however, we would not expect a column of solid water in the vertical line, and the pipe would only help a little in preventing salt water from carrying over to the condenser. A better baffle could be designed, but we would still be limited by the evaporator volume and its ability to handle such low-pressure vapor.

(b) In a proper heat balance on a ship, it should be possible to take vapor from the evaporators at 12 pounds gage and use it in the feed heaters, thus saving this amount from some other source. Thus, the steam used for evaporators need not be wasted as far as its energy is concerned.

The only time we waste the available energy in steam is when we throttle or reduce pressure by restricting its passage through a valve. This is an energy waste. This point will be fully discussed in this series. On the other hand, if the pressure is dropped by expanding in an engine or turbine, or if the heat is transferred through the walls of a heat exchanger usefully, it is not an energy waste.

QUESTION

Dear Chief,

I am greatly interested in your heat articles appearing in the current issues of Pacific Marine Review and I should like to have your figures and comment on the following practical problem.

Dry saturated steam at 22 lbs. absolute pressure is blowing through a pipe 7 sq. ins. area into a surface condenser where the Kenotometer registers 96% perfect vacuum; steam is condensed to water at about 70 degrees F.

(a) What is the velocity of the steam?

(b) What amount of water in lbs. per minute condensed?

(c) What heat loss in Btu per minute?

(d) What fuel loss with boiler efficiency at 80% and boiler fuel at 18,500 Btu?

Yours faithfully,

H. L.
Vancouver, B. C.

ANSWER

The writer has offered a problem which is quite difficult to answer and "The Chief" will attempt only a partial solution.

Taking the problem backwards, we can calculate the heat loss per pound of steam discharged.

Btu content of 22 pounds absolute steam is 1157.8, or say 1158.

Btu content of the liquid at 70°F. is 38.03, or say 38.

The difference is 1120 Btu. This is the heat loss per pound of steam, question (c).

Under (d) then, we consume fuel Btu equivalent to 1120 modified by boiler efficiency. 1120 divided by .80=1400 Btu. The weight of fuel used, then, is 1400 divided by 18,500=.0756 pounds of oil wasted per pound of steam discharged into the condenser.

(a) and (b). A discussion of the flow of steam in pipes is much too involved to present here. A solution could not be obtained unless the length of the pipe were known, also, the material of the pipe and some guesses as to its relative roughness on its internal surface. In this problem, the length would be from where the gage is located indicating 22 pounds absolute to the entrance to the condenser. This pipe, about 3-inch diameter, at such a low pressure would not discharge nearly as much steam as might be expected and the velocities would be extremely high.

For a complete discussion on this part of the problem, refer to some good handbook, such as Kent's "Mechanical Engineer's Handbook," pages 5-20 in the 1936 edition.

A rough calculation, assuming about 20 feet length of pipe, shows a velocity of about 14,000 feet per minute, and about 2000 lbs. of steam per hour flowing. Multiplying by .0756, we find 151 lbs. of fuel oil per hour wasted. This figure can roughly be modified by the reciprocal of the square root of the pipe length. Thus, if pipe is 40 feet long, the figure would be multiplied by

$$\frac{1}{1.41}=.71;$$

and, if 10 feet long, would be

$$\frac{1}{.71}$$

=1.41, or 41 per cent more.

THERMODYNAMICS

Radiation

Heat transfer by conduction was discussed in our August issue.

Heat transfer by radiation may be estimated by the following modification of the Stefan-Ballzmann formula.

The heat transfer from one surface to another parallel surface is

$$k\left(\frac{T_1}{100}\right)^4 - k\left(\frac{T_2}{100}\right)^4$$

Btu per square foot per hour.

T_1 is absolute temperature of hot surface.

T_2 is same for the cool surface.

Add 460 to temperature degrees Fahrenheit to get absolute temperature.

The constant k for several sub-

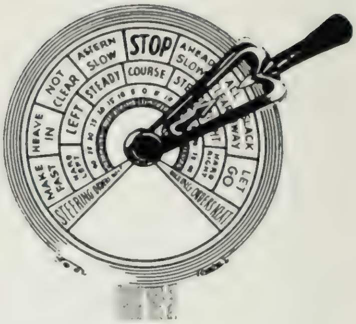
(Page 140, please)

Table I

Material	*Constant k*
Best radiation, black body	.1618
Glass	.154
Dull brass	.036
Lamp Black	.154
Copper, very slight polish	.028
Dull wrought iron, oxidized	.154
Ordinary iron	.056
Polished iron	.047
Dull zinc	.034
Cast iron, highly oxidized, rough	.157
Plaster, rough, white	.151
Slate	.115
Water	.112
Ice	.106

Steady as you go!

KNOWLEDGE IS THE STRAIGHT COURSE TO ADVANCEMENT



A Department for Deck Officers

by "The Skipper"

Questions Welcomed. Just Address "The Skipper," Pacific Marine Review, 500 Sansome Street, San Francisco, California

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RULES OF THE ROAD

I. DEVELOPMENT AND GENERAL

DEVELOPMENT IN AMERICA

In the United States of America we have five sets of rules of the road, namely:

1. International Rules of the Road.
2. Inland Rules of the Road.
3. Pilot Rules for Certain Inland waters of the United States.
4. Pilot Rules for Rivers whose waters flow into the Gulf of Mexico.
5. Pilot Rules for the Great Lakes and their connecting and tributary waters.

The International Rules were formulated by an International Marine Conference held in Washington, D. C. in 1889 and adopted by the Congress of the United States in 1890, and made effective on October 7, 1897. The rules of navigation prescribed by the International Rules are mandatory upon all vessels, of all nations, upon the oceans of the world; size, speed or the fact that the vessel is carrying mail or passengers gives no preference over an ordinary small vessel.

The Inland Rules of the Road are peculiar to the United States of America and are binding upon all vessels navigating our Inland waters. These rules were enacted by Congress on June 7, 1897. These two sets of rules are statutory, that is, each article of the International and Inland rules is a separate and distinct Federal statute, codified in title 33 of the Code of Laws of the United States. When these statutory rules were adopted, it was obvious that from time to time various additional rules would be required to regulate the navigation of individual types of vessels upon our vast system of navigable waters. The Board of Supervising Inspectors of the Bureau of Marine Inspection and Navigation under the Department of Commerce were authorized to promulgate whatever local rules they may, from time to time, deem necessary and vital to assure safe navigation upon local waterways. These rules are to be found in:

1. Pilot Rules for Certain Inland Waters of the United States.
2. Pilot Rules for Rivers whose waters flow into the Gulf of Mexico.
3. Pilot Rules for the Great Lakes and their connecting and tributary waters.

These latter three sets of rules are not statutory, however they have the force of law providing they do not conflict with the statutory Inland rules.

All of these sets of rules are known to many, but they are thoroughly understood by only a few of our bridge watch officers. As already mentioned, each article of the International and Inland Rules is a Federal statute, that brings to mind a famous quotation of the United States Supreme Court: "After a statute has been settled by judicial construction, the construction becomes as much a part of the statute as the text of the statute itself." Without a knowledge of these constructions no man can know the law.

It is realized that very few of our merchant marine officers are versed in the law; however, no man can understand and apply the Rules of the Road by simply memorizing the text of the thirty-two articles. It is essential that every officer standing a bridge watch should be familiar with the judicial interpretation of all of these rules. Unfortunately, in many instances this phase of education comes too late, and usually as the result of a collision in which the ship was held to blame solely upon some violation of the Rules of the Road. No officer ever wilfully violates the rules, but ignorance of the law is no excuse at any time.

QUESTION

What is the penalty for violation of the Rules of the Road?

ANSWER

Our Inland Rules provide a penalty of $50 fine upon any individual who neglects or refuses to observe the provisions of the rules, and for all damages sustained by a passenger in his person or baggage by such neglect or refusal. Also, every vessel that shall be navigated without complying with the provisions of the Inland Rules shall be liable to a penalty of $200 (one-half to go to the informer). The vessel itself is liable for this sum and may be seized and proceeded against by action in any district court of the United States having jurisdiction of the offense. In addition to this statutory penalty, a violation could also bring about a suspension or revocation of the offending officer's license.

The International Rules contain no such penalty clause, but, a violation will not go unheeded should the vessel be involved in collision.

The rules of the road, if lived up to and obeyed by all, are almost a certain preventive against collision; our Admiralty Courts are rigid in requiring all, merchant and naval vessels alike, to obey the rules.

QUESTION

On whom is the burden of proof?

ANSWER

When a vessel is involved in collision, the courts will in every case place upon the vessel the burden of proving, not merely that its failure to comply with the rules *did not* contribute to the accident, but *that it could not possibly have been one of the causes of the accident.* This will place a burden and require a tremendous amount of testimony and proof upon the part of the persons involved. A few common violations upon which vessels have been held at fault are: improper lights, wrong whistle signals, excessive speed in fog, and poor lookout.

QUESTION

What is the legal personality of a vessel?

ANSWER

In American Admirality procedure, a vessel is considered to possess a legal personality in her own right, and is responsible for her own wrong-doing when a collision follows a violation of the Rules of the Road. In other words, the vessel can sue or be sued in her own name, independent of any individual; this is known as a suit *in rem* and is found only in Admiralty Law.

QUESTION

What is the divided damage rule?

ANSWER

In American Admiralty courts, the divided damage rule is always applied when two vessels are both to blame in a collision case. Even if one vessel is only very slightly at fault and the other vessel is grossly negligent, the divided damage rule is applied, meaning that each vessel shall pay one-half the costs of the total damage sustained by both vessels. This rule is inflexible in our Federal Courts and it often places a terrific burden upon the vessel that is only slightly at fault.

For instance, vessels A and B are in collision. Vessel A is found to be 10 per cent at fault and sustains damage amounting to $10,000; vessel B is 90 per cent to blame and sustains damage amounting to $100,000. The divided damage rule will be applied and each vessel will be required to pay $55,000 as her share of the damage.

QUESTION

How are collisions classified?

ANSWER

We can divide the collision cases in American Admiralty into three classes, namely:

1. When both are to blame, the divided damage rule will apply (these are the most common and numerous cases).
2. When only one vessel is to blame, then the offending vessel will pay all the damages.
3. When neither vessel is to blame, the accident is classed as inevitable; then each vessel will bear the cost of her own damage. This is by far the most unusual case; in fact, over a period of about forty years, only approximately one per cent of the collision cases have fallen into this class.

QUESTION

How do the rules of the road apply to the modern navigator?

ANSWER

This doctrine of American Admiralty, together with the numerous and conflicting rules of the road, places an added burden and responsibility upon our navigators. As already mentioned, the International and Inland Rules were promulgated about 50 years ago, and, with the exception of a few amendments, they are substantially the same today. It is now realized that changes in the rules are necessary. The existing rules were formulated during the days of sail and have stood the test of time; however, modern ships are faster and larger, waterways more crowded, and commerce more diversified. Proposed changes in the rules have been formulated but as yet have not been adopted by any nation. Changes in the law come slowly and in the meantime we must struggle along with the existing rules.

For example, a steamer making way through the water in fog while on the high seas will sound one prolonged blast on the whistle at two minute intervals, in accordance with the provisions of article 15a of the International Rules; should she come to a dead stop while in fog on the high seas, she will then sound two blasts on the whistle at two minute intervals, in accordance with the provisions of article 15b of the International Rules. Upon crossing the line of demarcation into inland waters of the United States, while making way through the water in fog, she must change the whistle signal to one prolonged blast on the whistle at one minute intervals, in accordance with article 15a of the inland Rules; should she come to a dead stop while underway in our inland waters, she will continue to sound the same signal because the two-blast signal is not provided for. Even in clear weather there is a marked difference in some of the signal requirements such as, the passing signals, and visual day and night signals for vessels not under command. These will be discussed in a later article of this series.

A difficulty arises as to how the mariner can ascertain the exact moment when his vessel crosses the line of demarcation; in many cases it is a hard thing to do even in clear weather; in fog it is a virtual impossibility in some localities. Look at the chart of Puget Sound and Juan de Fuca Straits. The line of demarcation extends from Angeles Point to Hein Bank lighted bell buoy, a distance of about 23 miles of open water. It is of the utmost importance that the navigator know the exact location of his vessel at all times. This was emphasized in the case of *Border Line Transportation Company v. Canadian Pacific Railway (Wash. 1919) 262 F. 989*. Two vessels collided off Hein Bank lighted bell buoy. Both masters had thought they were in Inland Waters of the United States and had sounded signals accordingly. At the investigation after the collision, it was proved that both vessels were, in fact, 100 yards to the West of the line and in Canadian waters where the International Rules apply.

The navigator must use every means at his command, such as visual bearings, radio bearings and soundings in order to know the precise moment when his vessel crosses the line of demarcation and then instantly change his signals accordingly.

QUESTION

Is the use of the danger signal ever permitted in fog when the vessels are not in sight of each other?

ANSWER

Yes, it must be used in Inland Waters of the United States whenever its use is necessary.

The danger signal, not less than four short blasts, is authorized only in Article 18, Rule 3, and Article 18, Rule 8, of the Inland Rules. Such signal is omitted entirely from the International Rules. Most navigators regard the danger signal as a clear weather signal only, this is not surprising because the text of the rules is vague upon this point. In the case of the Virginian in 1916, the courts ruled that the danger signal must be used in any weather, whenever necessary to avoid collision; that is, if the course or intention of the other vessel is not understood, or the signals of the other vessel cannot be complied with at the time.

Owing to the fact that the danger signal is not authorized in the International Rules of the Road, nor has its use ever been sanctioned by the courts, I believe there is some danger in its use on the high seas. In case of collision after sounding the danger signal on the high seas, there is always the possibility that the other vessel may plead that the danger signal was thought to be a backing signal, and that when the vessel that sounded the signal did not reverse, he was misled by her apparent failure to act on her own signal. This risk may be very remote. I have seen many situations on the high seas when the danger signal would have been the appropriate signal to use. However, in spite of the fact that no vessel has ever been held solely at fault for using the danger signal on the high seas, its use is still without either court or statutory approval.

This series will be continued next month with clarifications of the various situations and rules.

Deck Officers' Licenses for August

SEATTLE

Name and Grade	Class	Condition
I. D. Knox, Chief	.SS, and GT	RG
H. C. White, Chief	.SS, and GT	RG
G. M. Tuttle, Jr., 2nd Mate	.SS, and GT	RG
M. A. Allen, 3d Mate . . .	.SS, and GT	O
W. Michalcowiz, 3d Mate .	.SS, any GT	O
G. C. Reed, 3d Mate	.SS, any GT	O
HONOLULU, T. H.		
I. Mishani, 3d Mate	.SS & MS, any GT	O
A. H. Hodgins, 2nd Mate .	.SS & MS, any GT	RG
R. J. Blood, 2nd Mate . . .	.SS & MS, any GT	RG
W. C. Wiechert, 2nd Mate	.SS & MS, any GT	RG
B. Frankel, 2nd Mate . . .	.SS & MS, any GT	RG
SAN PEDRO		
O. Lund, Master	.SS, any GT	RG
D. R. DeSpain, 2nd Mate .	.SS, any GT	RG
P. D. Petrich, 3d Mate . . .	.SS, any GT	O

Abbreviations: SS is steamship; MS is motorship; GT is gross tonnage; O is original license; RG is raise of grade. All of these licenses are for ocean service.

Engineers' Licenses for August

SEATTLE

Name and Grade	Class	Condition
G. Rossart, 3d Asst. . . .	.SS, any GT	O
N. L. Short, Chief	.MS, any GT	O
SAN PEDRO		
H. B. Hotchkiss, Chief . .	.SS, any GT	RG
J. P. McArdle, Chief . . .	.SS, any GT	RG
J. H. Kane, 2nd Asst. . . .	.SS, any GT	RG
H. L. Hutchins, 3d Asst. .	.SS, any GT	O
E. G. Richards, 3d Asst. . .	.SS, any GT	O
C. A. Stuck, 3d Asst. . . .	.SS, any GT	O
H. M. Dobbs, Chief	.MS, 5000 tons	RG
A. H. Hedberg, Chief . . .	.MS, 750 tons	RG
PORTLAND		
M. E. Poirier, 1st Asst. . .	.SS, any GT	RG

Abbreviations: SS is steamship; MS is motorship; GT is gross tonnage; O is original license; RG is raise of grade. All of these licenses are for ocean service.

PROBLEMS ANSWERED

(*Continued from Page 137*)

stances and surface conditions is given in table I herewith. The values are for temperatures below 600°F. and therefore not incandescent.

The constant for incandescent surface is .155.

An interesting and useful phenomenon involving heat transfer is the screen grid placed over open pipes venting explosive liquid tanks. With the screen, a fire outside the screen will not follow through it into the pipe and thus will not communicate the fire to the tank. The reason is that the cool metal in the screen cools the hot flame gases to below the combustion temperature.

To prove this, hold a screen of brass or copper over a candle flame. The flame will not pass through it. But, apply a lighted match to the gases coming through the screen and the flame appears above. The gases, but not the flame, have passed through.

Our next article will discuss the effects of heat.

Watch Your Step
Mind Your Head

Walking—the simplest form of motion over any surface—according to Webster, a progress of the body by motion of the legs in such a fashion as to have one foot (with bipeds), or two feet (with quadrupeds) always on the surface—should be practically automatic with every human being.

Yet, continuously we have to be reminded by signs to take the simple precautions of estimating clearance and of avoiding obstructions. In American ships, we see signs reading "Watch Your Step!" In British ships, many of the signs read "Mind Your Head."

An exchange comments on our failure to learn walking and gives the record of a week in one shipyard:

If practice makes perfect, you'd think we'd learn how to walk during an average lifetime. But we don't!

We continue to walk into trouble at every age just as absent-mindedly as the most absent-minded professor who ever appeared in a cartoon.

A machinist walking into stockroom slipped and fell, fracturing wrist.

Shipfitter stepped on section of 2-inch pipe, it rolled, causing him to fall and turn right ankle.

An electrician entering controller house missed a step, turned ankle.

Pipefitter walking through yard, caught toe under protruding boiler plate, fell and split chin.

Laborer crossing yard tripped and fell, injuring forearm.

These men were not carrying, lifting, or pushing anything, just walking, that's all.

They were simply not watching their step.

Manila Cordage Priorities

New Regulations of Interest to Marine Field

Because of the increased importance of rope in America's defense, the Office of Production Management, Washington, D. C., on August 29, 1941, issued a priorities regulation known as "Order M-36" and addressed to manufacturers of Manila cordage.

According to W. I. Atherton, sales manager of Tubbs Cordage Company, these O.P.M. priority regulations will necessitate several changes which will be of interest to the marine field.

O. P. M. Order M-36 designates three ropes containing Manila fiber that may be manufactured: Class A, Class B and Class C cordage. Class A and B ropes are made of pure Manila fiber. The former is manufactured to conform to U. S. Federal Specification TR-601a, and the latter represents a slightly lower grading. Class C rope, which in the case of the Tubbs Cordage Company will be designated as "Victory Brand," will be made of 50 per cent Manila fiber, the maximum permissible for this class under O. P. M. regulation.

Class A and Class B Cordage may be sold to the following:

(1) The Army and Navy of the United States, the United States Maritime Commission, the Panama Canal, the Coast and Geodetic Survey, the Coast Guard, the Civil Aeronautics Authority, the National Advisory Commission for Aeronautics, the Office of Scientific Research and Development.

(2) The government of any of the following countries: The United Kingdom, Canada and other Dominions; Crown Colonies and Protectorates of the British Empire; Belgium, China, Greece, The Kingdom of the Netherlands, Norway, Poland, Russia and Yugoslavia.

(3) Lease-lend.

(4) Any order with an A-10 or higher Priority Rating (see below for explanation of A-10).

(5) Any order where the cordage is to become a physical part of equipment or material being produced on a national defense order.

Under non-defense only the following industries may purchase Class A or Class B cordage, unless they carry an A-10 Priority Rating:

(1) Marine—for use by or for ships, towing, commercial fishing, and on inland waterways.

(2) Oil Wells—for use as drilling cables, catlines, spinning lines and torpedo lines.

(3) Mining—for use for hoisting and transmission of power.

Other non-defense industries or services unable to obtain an A-10 or higher Priority Rating will be able to purchase without restrictions Class C rope and Sisal rope and twine.

A-10 or higher Priority Rating in general is the rating which could be assigned to an order for cordage which has a direct relation to national defense or some indirect order to be used in connection with the completion of some contract held by someone other than a cordage manufacturer but directly connected with national defense. Some customers of cordage and twine manufacturers, however, have been granted the right to apply A-10 or higher Priority Rating as provided, for example, in Preference Rating Order P-22.

Preference Rating Order P-22 is issued for the purpose of facilitating the acquisition of material for the repair of property or equipment of certain industries and services. In general, it is an assignment of an A-10 rating to the following and covers both the "Producer" (user) and "Supplier":

(1) Federal, State, County, and Municipal Fire and police services, and highway maintenance.

(2) Carriers: (a) Urban, suburban, interurban, and intercity common, contract, and private carriers of passengers or freight; (b) railroads; (c) shipping.

(3) Plants engaged in producing chemicals by chemical processing of raw materials.

(4) Coke Converting.

(5) Educational institutions (including vocational training).

(6) Plants engaged in manufacturing explosives.

(7) Plants engaged in manufacturing farm machinery and equipment.

(8) Food processing or storing.

(9) Plants engaged in the production of equipment used in highway maintenance.

(10) Hospitals, clinics and sanatoriums.

(11) Plants engaged in the production of lumber.

(12) Plants engaged in the production of metals.

(13) Mines and quarries.

(14) Newspapers.

(15) Petroleum production, refining and transportation.

(16) Commercial radio broadcasting and communication.

(17) Research laboratories — industrial and academic.

(18) Rubber and rubber products.

(19) Shipyards and Ship Repair Yards.

(20) Telephone and telegraph communication.

All purchase orders by a "Producer" (user) must be endorsed:

"Purchase Order for Repair or Emergency Inventory-Preference Rating A-10 under Preference Rating Order P-22."

All purchase orders by a "Supplier" must be endorsed: "Purchase Order for Material required to fill a duly rated order for Repair or Emergency Inventory. This purchase order bears Preference Rating A-10 under Preference Rating Order P-22."

Designed to conserve the supply of vital Manila fiber, General Preference Order M-36 is wide in its scope, covering both Manila fiber and its processing, which includes its manufacture into rope.

"Production in all of the nation's cordage mills including our own has been greatly stepped up," stated Mr. Atherton. "We can assure all users in the Western States that we will be able to supply them with ample quantities of rope that will meet every requirement."

An Outstanding Maritime Organization

Since 1865 the San Francisco Marine Exchange Has Kept Track of Ships

The hub of San Francisco Bay's maritime activities is its Marine Exchange.

It is a very good example of what determined leadership and able management can achieve during adverse times and in the face of many difficulties.

Since 1865, when it was established, the Exchange has developed a memorable background. Three years ago, when it withdrew from the Chamber of Commerce to be reorganized as a separate and individual institution with its own officers and board of directors, and dependent upon its own financial resources, its future was rosy, but the immediate outlook was bleak.

M. A. Cremer, Manager of San Francisco's Marine Exchange

Edward McCarthy, chief of the lookout station of the Marine Exchange

In its first year as a separate entity, under the presidency of Harry S. Scott, president of the General Steamship Corporation, and a board of directors representative of the industry, the Exchange, with the active support of its members, and under the executive management of M. A. Cremer, has become an outstanding maritime association.

During the past two years, under the presidency of Farnham P. Griffiths of McCutchen, Olney, Mannon and Greene, many new activities were undertaken with unusually outstanding success, to the point that the Exchange is now regarded in Washington, D. C., in New York, in Sacramento, and in all ports as the voice of the maritime industry of San Francisco Bay.

Representative Board of Directors

The directors, elected annually by the members, represent the respective branches of the industry.

Former and present members of the board are outstanding men in the Bay shipping and related industries. Their names, an index of the prestige of the Exchange, are:

Geo. A. Armes, president, General Engineering & Dry Dock Co.

Leo P. Bailey, manager, steamship department, Balfour Guthrie & Co., Ltd.

Oscar J. Beyfuss, ship broker.

M. J. Buckley, vice president, American President Lines.

Fred Doelker, vice president, Grace Line.

Hugh Gallagher, operating manager, Matson Navigation Company.

E. H. Harms, McCormick Steamship Co., and general chairman, Propeller Club Convention.

Allan K. Hulme, vice president, General Steamship Corp.

Lewis A. Lapham, American Hawaiian Steamship Co.

Joseph F. Marias, president, State Board of Harbor Commissioners.

F. J. O'Connor, Donovan Lumber Company.

H. H. Pierson, Pacific Coast manager, De La Rama Steamship Co.

A. F. Pillsbury, Pillsbury & Martignoni.

C. H. Robertson, assistant manager, Marine Department, Standard Oil Co. of California.

John J. Walsh, president, Furness (Pacific), Ltd.

The Marine Exchange floor, San Francisco. This room is internationally famous for its splendid marine murals by Coulter and other noted artists

Accomplishments

The first group activity undertaken by the Exchange arose as the result of a petition to the United States Board of Army Engineers from the California Division of Highways to close at night a number of drawbridges in the Sacramento and San Joaquin deltas. Since the closing would have caused great hardship and expense to the inland waterway traffic, which comprises a large part of the Bay's commerce, a committee was formed, representing operators of barges and tankers, Bay pilots and the yacht clubs. After several meetings with state officials, the committee arrived at an agreement approved by the Board of Engineers which was a complete victory for the Exchange.

During the early part of last year, a ruling by the United States Commissioner of Customs placed heavy penalties on cargo discharged at San Francisco that did not appear in the manifest for discharge at this port. Two sub-committees of the Customs committee of the Exchange made an exhaustive study of the situation, since the ruling caused great inconvenience and expense to the steamship companies. The resulting brief filed by the committee with the Bureau of Customs resulted in withdrawal of the ruling. In this particular case, the committee acted for the ports of the Pacific Coast, and the result of its action affected not only West Coast ports, but those of the Atlantic and Gulf as well. The Customs committee has also secured extension to twenty-four hours of inspection of incoming vessels by the Public Health and Plant Quarantine authorities. The resulting saving in ships' time is too great to calculate.

Ship Building

Currently, the Exchange is engaged in the forming of a committee of representatives of the Bay's shipbuilding plants to cope with the problem of training men for work in the yards. This is the most important problem in Northern California, since it confronts Northern California's present principal industry — the building of approximately a billion dollars' worth of merchant and naval vessels.

Growth in Membership

The success attained by the members of the Exchange in using its facilities to secure new services to defeat harmful legislation and rules, to combine in securing objectives, plus the fact that it has been found advantageous to be identified with the Exchange has resulted in a great increase in membership.

Individual membership cards issued have increased from a few hundred to several thousand.

The Membership Committee expects to see a considerable increase during the coming year, largely as a result of the huge local shipbuilding program which has resulted in a great expansion of the number of firms and individuals financially interested in the Bay's maritime industry.

For many years after the Marine Exchange was founded, the sailing ships far outnumbered the steamers on the Pacific Ocean trade lanes. This famous American clipper Glory of the Seas was a frequent visitor.

U. S. Pipe Bending

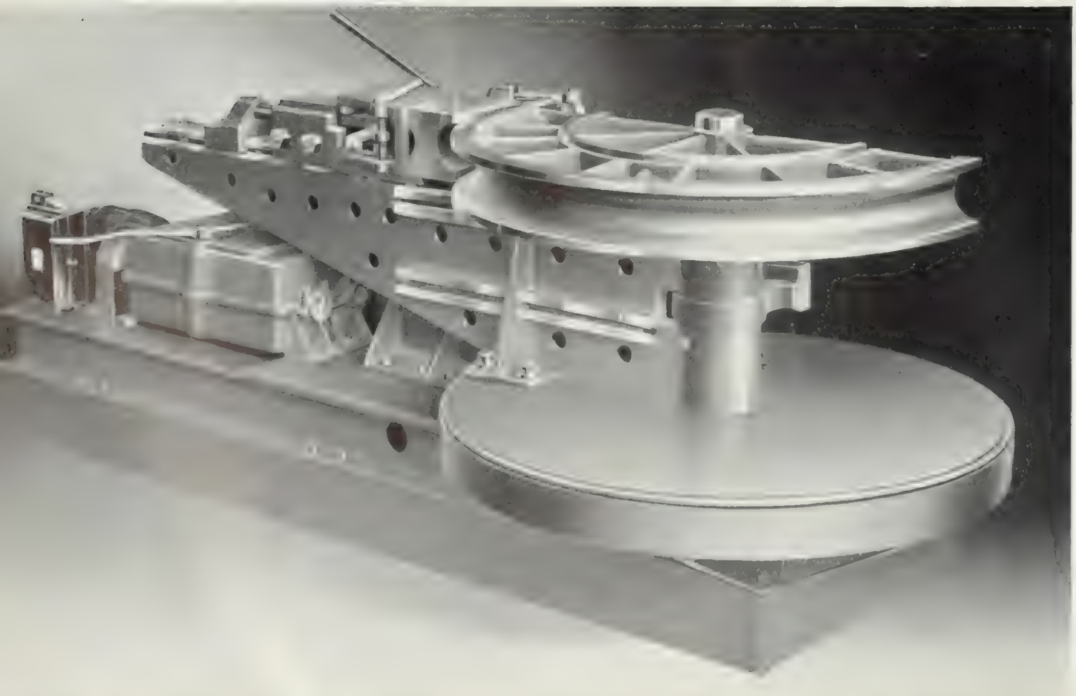
Announces 8-inch Capacity Units in their Popular Line of Pipe Bending Machines

Since the last issue of Pacific Marine Review came off the press, the 6″ and 8″ capacity U. S. Pipe Benders have made their debut to the American shipyards. In the past thirty days, these machines have been established in the Bethlehem Shipbuilding Yards in San Francisco and San Pedro, and in the Todd-California Yard in Richmond. Further deliveries scheduled before the first of December are for Moore Dry Dock Company, General Engineering and Dry Dock Company, Richmond Shipbuilding Corporation, Oregon Shipbuilding Corporation, and additional machines to both West Coast yards of the Shipbuilding Division of Bethlehem Steel Co., Ltd.

These machines are built by the U. S. Pipe Bending Company of San Francisco with a first-hand knowledge of every problem and demand that shipbuilding projects can present. They are made for accurate and fast production, and can be operated by any mechanic. Further, to insure against harmful results because of neglect, all gears and bearings needing regular lubrication are run in oil. An Alemite system handles the few remaining points.

In addition, there has been incorporated in these machines the experience gained by twenty years of operation as a business which has existed only by its superior knowledge and methods in pipe bending. This is apparent in the constantly improved clamping and holding blocks, safety features and automatic shut-offs, the oil bath for all essential gears and bearings, and a transmission which has never needed repair. This transmission provides three speeds in both forward and reverse directions, speeds determined, not by the time in which the pipe can be bent, but the time required for the metal to flow properly to ensure a good job.

The strongest argument in favor of this machine is the refusal of all purchasing agents and shop superintendents who have ever seen these machines, to be content with another type. To supplement this is a progressive expansion from 8000 square feet of questionable working space in 1939 to the present plant which encompasses 40,000 square feet and two machine shops.



The new, 8-inch capacity, U. S. Pipe Bending Machine

On the Ways — SHIPS IN THE MAKING

LATEST NEWS FROM AMERICAN SHIPYARDS

September in The Shipyards

During the month of September, the new emergency shipyards built by the U. S. Maritime Commission began to roll along into production.

The score of the major shipyards for that month according to reports is:

12 deliveries
24 launchings; and
48 keel layings.

We may not have caught all the events in each category but these are good round numbers, the proportion is approximately correct and the condition indicated for the industry is a very rosy future.

All of the shipyards are full of work ordered, with delivery dates running well into 1944.

The keel laying indicates that we are getting close to the goal of two ships a day set by the Maritime Commission for 1942. In other words, we are almost three months ahead of schedule on our emergency shipbuilding effort, although several of the emergency shipyards are not yet functioning. This indicates wise emergency design by the Commission and great organizing ability on the part of the shipbuilders.

The story of the "Liberty Fleet Day" 14 launchings is told elsewhere in this issue. The keel layings were not attended by any ceremony but the record is impressive.

In the "Liberty Fleet" keel laying, the California Shipbuilding Corporation at Terminal Island, Los Angeles, California, shared honors with the Bethlehem Fairfield Shipbuilding Co. of Baltimore, Maryland, for the highest record in September. Each yard laid seven keels.

Richmond Shipbuilding Corporation, Richmond, California, laid six, and the Oregon Shipbuilding Corporation, Portland, Oregon, laid five. North Carolina Shipbuilding Corporation, Wilmington, North Carolina, laid four. Houston Shipbuilding Corporation, Houston, Texas, and South Portland Shipbuilding Corporation, Portland, Maine, each laid three keels. Alabama Shipbuilding and Dry Dock Co. laid two keels.

Three yards on the Pacific Coast laid a total of 18 keels, four yards on the Atlantic Coast laid a total of 15 keels, and one yard on the Gulf Coast laid three keels.

"LIBERTY FLEET DAY" LAUNCHINGS

Launching Time	*Name of Ship*	*Place of Launching*	*Sponsor*
7:00 a.m. EDST	Surprise	Sun Shipbuilding & Dry Dock Co., Chester, Pa.	Mrs. W. F. George
3:15 p.m. PST	Ocean Voice	Todd-California Shipbuilding Co., Richmond, Cal.	Mrs. F. C. Cocks
10:00 a.m. EST	James McKay	Bethlehem Steel Co., Sparrows Point, Baltimore, Md.	Mrs. G. L. Duncan
12:30 p.m. EST	Patrick Henry	Bethlehem-Fairfield Shipyard, Baltimore, Md.	Mrs. H. A. Wallace
10:15 a.m. PST	Alcoa Polaris	Consolidated Steel Corp., Ltd., Los Angeles, Cal.	Mrs. W. Holzhauer
10:30 a.m. PST	Frederick Funston	Seattle-Tacoma Shipbuilding Corp., Tacoma, Wash.	Miss B. E. Funston
1:30 p.m. CST	African Planet	Ingalls Shipbuilding Corp., Pascagoula, Miss.	Mrs. C. F. Stapleton
3:30 p.m. EDST	Louise Lykes	Federal Shipbuilding & Dry Dock Co., Kearny, N. J.	Mrs. N. L. Wooten
12:00 noon PST	Steel Artisan	Western Pipe & Steel Co., So. San Francisco, Cal.	Mrs. W. A. Ross
4:00 p.m. EDST	Adabelle Lykes	Pusey & Jones Co., Wilmington, Del.	Mrs. A. Thomas
4:45 p.m. EDST	Sinclair Superflame	Bethlehem Steel Co., Fore River, Quincy, Mass.	Mrs. H. A. Hassan
2:30 p.m. PST	John C. Fremont	California Shipbuilding Corp., Los Angeles, Cal.	Mrs. S. Downey
3:30 p.m. PST	Star of Oregon	Oregon Shipbuilding Co., Portland, Oregon	Mrs. C. A. Sprague
5:30 p.m. PST	Ocean Venture	Todd-California Shipbuilding Co., Richmond, Cal.	Mrs. C. P. Bedford

At California Shipbuilding Corporation

(1) Visit of Lord Halifax, July 23, left to right, back row, J. A. McCone, vice president and general manager; S. D. Bechtel, president; Lord Halifax; Ben R. Meyer, president, Union Bank & Trust Co.; Harry Bauer, vice president and general manager, Southern California Edison Co.; H. C. Price, vice president, Bechtel-McCone-Parsons Corp.; front row, Preston Hotchkis, chairman of executive committee, Consolidated Steel Corp.; D. J. Cahill, president, Western Hardwood Lumber Co.; and Jerome K. Doolan, assistant general manager, Calship. (2) Lord Halifax addresses shipbuilders. (3) July 14, Wm. Knudsen, OPM Administrator, climbs stairway on Way No. 1 with K. K. Bechtel, secretary-treasurer of Calship. (4) At first keel laying, May 24: H. J. Kaiser, president, Richmond Shipbuilding Corp.; K. K. Bechtel; J. E. Schmeltzer, director of construction, Maritime Commission; Mr. McCone and Captain Howard L. Vickery, Maritime Commissioner. (5) Todd executives visit yard, left to right, J. S. Connell, manager of construction; J. D. Reilly, president, Todd Shipbuilding Corp.; Joseph Haag, Jr.; vice president of Todd; Mr. Doolan; R. J. Lamont, president, Seattle-Tacoma Shipbuilding Corp.; Elwood Layfield, chief engineer, Bechtel-McCone-Parsons Corp.; Charles T. Draney of Bechtel-McCone-Parsons Corp.; and Mr. McCone. (6) Mr. Knudsen inspects the yard with W. C. Ryan, naval architect; Mr. Doolan; Ralph M. Parsons, vice president, Bechtel-McCone-Parsons Corp.; K. K. Bechtel; and Basil Kehoe, manager of Calship production. (7) Lord Halifax departs with Mr. McCone, left, and S. D. Bechtel. (8) Henry J. Kaiser, president, Henry J. Kaiser Company, left, and Edgar F. Kaiser, vice president and general manager, Oregon Shipbuilding Corp.

A Seaplane Railway For a Seaside Airport

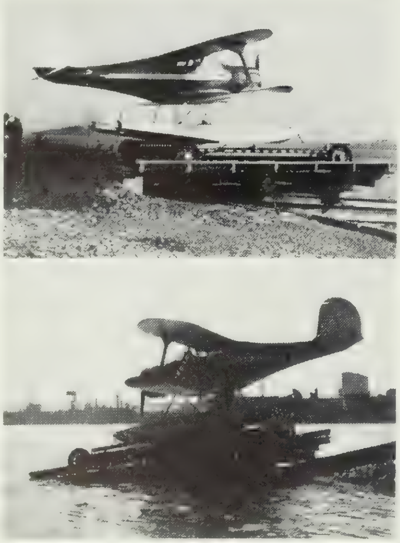
Methods for removing seaplanes and flying boats from the water to hangars have been rather primitive to date in most airports. "Bathing suit gangs" have attached wheeled "dollies" to the floats of seaplanes or beaching gear to flying boats while they were still afloat. Then the planes have been hauled up a ramp by tractor or other means. In winter weather and cold water this is a disagreeable job which takes considerable time.

To improve and speed up this operation, the Boston Airport installed a "seaplane railway," with tracks and a carriage supporting a flat deck, forming a movable ramp. It was completed last fall and is now in frequent use.

This seaplane railway system consists of a cradle, 25 feet by 25 feet, which runs on a pair of tracks so that the cradle may be lowered into and removed from the water. The design is such that the platform on the top of the cradle is horizontal and at field level when in the uppermost position, while it maintains a slope of 1 to 6 when in the water at any stage of tide. The cradle is operated by an electric hauling machine at a speed of seventy-five feet per minute.

To take a seaplane from the water to a hangar, a wheeled dolly is locked onto the floor of the platform of the cradle, which is then lowered into the water until the top of the dolly is just about water level. Then the plane is taxied over until it grounds on the dolly. From here the cradle, dolly and plane are hauled to the upper position in two to three minutes. Subsequently, the plane, on the dolly, taxies under its own power to any desired location on the field.

In case it is necessary to remove a plane from the water for a short time only, possibly to examine the floats, the dolly is not required. The cradle itself is lowered until its platform, at the inner end, is just above water. The plane is taxied over until the floats ground on the platform. Then the cradle and plane are quickly hauled to the upper position, with the platform horizontal at field level and the plane readily accessible.



Launching a seaplane, Boston airport

This seaplane railway, designed by Crandall Dry Dock Engineers, Inc., Cambridge, Mass., is an adaptation of the larger yacht railways and railway dry docks which they design up to capacities of 5000 tons and more. The installation was made for the Park Department, City of Boston, William T. Long, commissioner, and John J. Murphy, chief engineer.

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Standardizing Electric Lighting Facilities

The national and international emergency demands that American electrical industry simplify and standardize lighting facilities to avoid serious complications in manufacturing, in distribution, and in utilization, Samuel G. Hibben, director of applied lighting, Westinghouse Lamp Division, Bloomfield, N. J., recently told executives attending the Municipal Electric Utilities Convention at Jamestown, N. Y.

MARINE DEPARTMENT
AETNA INSURANCE CO.
QUEEN INSURANCE CO.
MARITIME INSURANCE CO., LTD.
FIDELITY PHENIX FIRE INS. CO.
Commercial Hull Dept.
AUTOMOBILE INS. CO.

MATHEWS & LIVINGSTON
Marine Underwriters
200 BUSH STREET · · · · SAN FRANCISCO
Offices at: Colman Bldg., Seattle · 111 West 7th St., Los Angeles

Standardization is particularly valuable now for interchangeability of devices, especially in such places as island military bases. Simplification would cut cost, avoid duplicate stocks, facilitate handling and make maintenance easy.

Light Bulbs

Light bulbs manufactured in this country should be usable all over the world. At the present time, European lamps can be used here but American lamp bases will not fit the sockets abroad. Lamps used on aircraft for instance should be the same whether they are purchased in California or Montreal, or Iceland, or Alexandria. Obviously we cannot easily ship portable flashlights to Moscow if the Russian batteries do not fit the tubes, or if the Russian flashlight bulbs have different threads.

Types of wire and insulations could be simplified. Lighting terminology, measurement of color, and the accepted functions of the human eye in seeing, should be universally the same.

Voltage

In the United States, voltage service should be standardized. At the present time, electrical service in different cities and localities varies from 110 volts to 125. The demand for 110 volts for lighting throughout the country represents less than two per cent of the total, for 115 volts a little more than 25 per cent, for 120 volts more than 65 per cent, while the demand for 125 volt service is less than seven per cent. Mr. Hibben recommended that voltage service be standardized at 120 volts because the continuation of a plurality of distribution voltages encourages the temptation for adding other nominal voltages such, for example, as 125 which, unless it is to be universally standardized, should be eliminated now.

Centralized purchasing by the Federal Government for Army camps, Naval and air bases and many widely distributed structures makes it doubly advisable today to have one nominal distribution voltage everywhere.

Practically all electrical merchandise, small appliances such as heater units and electric fans, are designed to give best performance at around 118 volts. Reduced voltage results in poor service, and over-voltage in short life.

Another factor favoring voltage standardization is that multi-voltage service requires large and duplicate stocks of illuminants, costing manufacturers much in investments and complication jobbing and retailing. Also, according to Mr. Hibben, voltage standardization would help in decreasing costs of lamps.

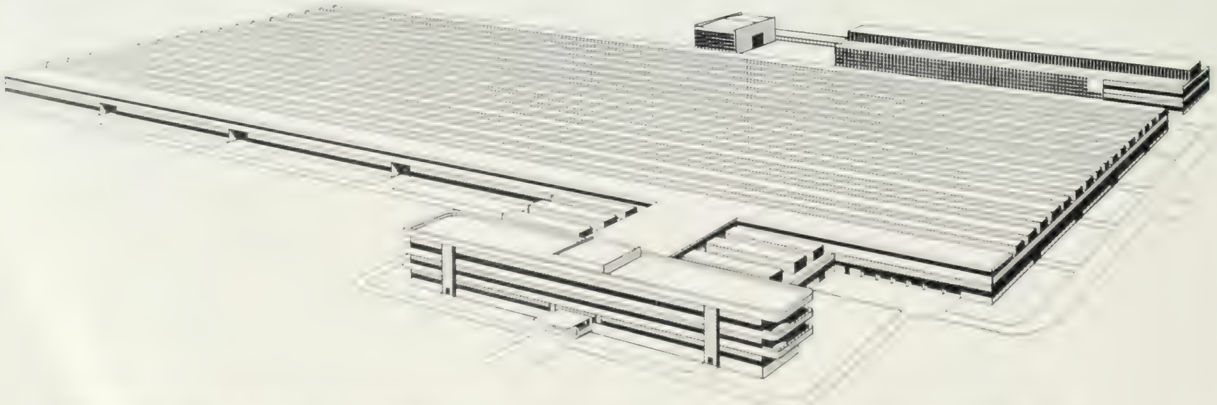
New National Defense Plant for Sperry Gyro.

With Army, Navy and civil officials participating, ground was broken on Tuesday, July 8, at the site of the proposed Lakeville plant of the Sperry Gyroscope Company, an architect's drawing of which is shown above.

Located in Nassau County, south of the Northern State Parkway and adjacent to the Queens County line, the new structure will be the largest National Defense plant in this area.

The Sperry plant will include 1,350,000 square feet of floor space and will place 26 acres under one roof. The factory building will be one story, 1440 feet long by 640 feet wide. In addition there will be a three-story administration building. According to an announcement by R. E. Gillmor, president of Sperry Gyroscope, 7000 new employees will work at the Lakeville plant.

Aeronautical and marine instruments will be built in Sperry's new Lakeville plant which will be constructed under an arrangement with the Defense Plant Corporation of the Reconstruction Finance Corporation. The plant will be the property of the D. P. C. and will be leased by Sperry.



Architect's sketch of the plant for the Sperry Gyroscope Company now nearing completion at Lakeville, N. Y.

Running LIGHTS

Who When Where

Own Passenger Offices for M. M.

Commander Robert C. Lee, executive vice president of Moore-McCormack Lines, announced on September 27th that his company would open its own general passenger agency in San Francisco on October 1st. A staff is being organized to handle the passenger activities of the ships of both the American Republics Line and Pacific Republics Line, which Moore-McCormack Lines operates. Commander Lee said that the rapid expansion of passenger traffic between Northern California and the East Coast of South America prompted the company in this step. Moore-McCormack Lines has been represented in the San Francisco passenger field by the United States Lines. The Moore-McCormack quarters will be at 200 Pine Street. The company has had offices at this address but handled only the general operation and cargo activities of its lines.

The Pacific Republics Line, which is the principal activity of Moore-McCormack Lines on the Pacific Coast, operates between Vancouver, B. C. and Buenos Aires, Argentina by way of the Panama Canal. The company operates the new C-3 vessels, the Mormacsun, Mormacstar and Mormacsea, and until recently had also operated three additional cargo ships regularly but has transferred them to its Atlantic Coast service. Passenger activities for the American Republics Line vessels Brazil, Uruguay and Argentina, which operate out of New York to the East Coast of South America, have also been an important activity of the San Francisco organization.

The Navy's highly coveted "E", symbol of Excellence and Efficiency, was recently awarded to The Ford Instrument Company, a division of The Sperry Corporation, for "outstanding performance in the production of naval ordnance material for the National Defense Program." Assistant Secretary of the Navy Ralph Bard made the presentation on behalf of the Navy. In the above picture a group displays the "E" pennant which is flown with the Navy Bureau of Ordnance flag. Left to right: Hannibal C. Ford, President, The Ford Instrument Company; Lieutenant Commander Harold Baker, U. S. Navy, Inspector of Naval Ordnance; Thomas B. Doe, Vice-President and General Manager of The Ford Instrument Company; and Hon. Ralph Bard, Assistant Secretary of the Navy. . . . In making the presentation Mr. Bard said: "The Navy has asked for miracles of industrial production and what is more, we are getting them. To show our appreciation the Navy has awarded the coveted "E" to the management and employees of the Ford Company. It's our way of saying 'Well Done'." . . . Besides awarding the "E" to the company the Navy is awarding small lapel buttons bearing the "E" to each worker in the Ford Company. The Ford Instrument Company is located in Long Island City. It specializes in design, manufacture of computing mechanisms and naval gun fire control apparatus.

The Mariner's Club of California, next luncheon, noon, Wednesday, October 1, 1941, at St. Julian Restaurant, 140 Battery Street, San Francisco, in the beautiful new Mural Room; 85 cents includes everything. "Winged Horizons," over the nation's most scenic air route, presented by Major Ernie Smith, District Manager Transcontinental & Western Air Lines, Inc. This is a talkie-movie, which is the most scenic air route picture ever presented. Attend this luncheon and you will see from the air more of the nation than most people see in a lifetime. Do not miss this one—it is wonderful. Please remember to phone reservations to Douglas 2714. R. H. Glissman, chairman, luncheon committee; A. T. Hunter, President; Stanley E. Allen, Secretary-Treasurer.

Newly elected Bludworth, Inc. President is George Friedl, Jr., (center) shown with Vice Presidents Alf Gautesen and W. C. Blaisdell.

Election of New Officers of Bludworth Incorporated

At the annual election of officers of Bludworth Incorporated, a wholly owned subsidiary of International Projector Corporation, a major change in the organization of Bludworth Incorporated was perfected, and George Friedl Jr. was elected president, and Alf Gautesen and W. C. Blaisdell as vice presidents.

Mr. Friedl, who has been associated with International Projector Corporation as director of engineering and was formerly with Western Electric Company, is one of the outstanding electronic engineers of the country. He takes over with a full knowledge of Bludworth instruments. Messrs. Gautesen and Blaisdell need no introduction because of their long association with the marine field and particularly by their successful careers in the development of the well-known and highly recognized precision navigation equipment of Bludworth Incorporated. These men, together with the strong financial standing and modern plant facilities of International Projector Corporation, have established a complete organization to handle the affairs and rapidly increasing demand for Bludworth Radio Direction Finders and Supersonic Depth Finders.

The activities of the company, at present, are principally devoted to supplying equipment for national defense purposes. Its complete line of Bludworth Radio Direction Finders and Supersonic Depth Finders for all size cargo, passenger, tanker and towing vessels is available to ship owners and operators who value the benefits of navigation aids for safe and economical ship operation.

Supt. Engineer Eby Perfects Pitchometer

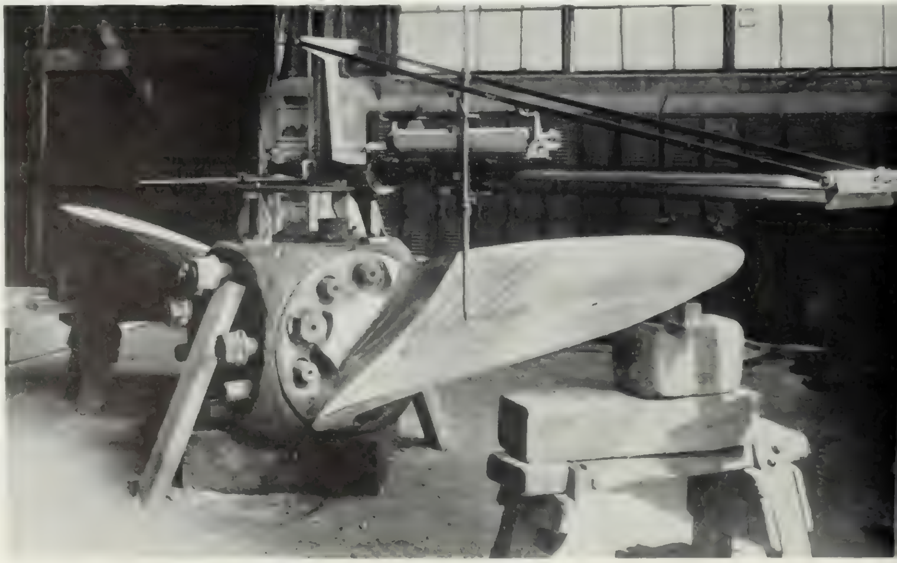
An unusual device known as a recording pitchometer, with which diagrams are made of ships' propellers, has just been patented in the United States and Great Britain by I. D. Eby, superintendent engineer of Moore-McCormack Lines, who has served many years with the company.

With the use of the recording pitchometer, propellers can be finished to greater accuracy than in general practice, where the methods used will not detect large areas of excessive metal which remain on blade surfaces and which cut down propeller efficiency. Mr. Eby declared that in one case he found it necessary to take almost two barrels of bronze chippings from a four-bladed seventeen-foot diameter propeller which had been in service six years. Needless to say, the performance of the vessel was greatly improved.

Moore - McCormack Lines have been using the device the last ten years and there are cases where savings up to 8% have been made in correcting ordinary commercial propellers, according to Mr. Eby. There is every reason, he said, why a twenty-ton propeller should be as accurately finished as the model propeller used in the model basin when that propeller was tested. The reason one vessel is a better performer than others of her type lies in the fact that the propeller of the good performer is nearer perfect than those on the others of her type, in his opinion.

Details of the working of the instrument follow:

The recording pitchometer is mounted on the propeller hub without removing the propeller from the shafting, while the vessel is in drydock; or it may be mounted on the propeller after this has been removed from the



The recording pitchometer, an unusual device patented recently by I. D. Eby, superintendent engineer of Moore-McCormack Lines, New York. With the use of the recording pitchometer diagrams are made of ships' propellers, which can then be finished to greater accuracy than in general practice today, where the methods used will not detect large areas of excessive metal. The metal remains on blade surfaces and cuts down propeller efficiency.

shaft and placed flat on the drydock floor or on the floor of the manufacturing plant when the propeller is being finished.

When mounted on the propeller hub the recording pitchometer extends from the hub outward to a radius of eleven feet and will make diagrams of a propeller having a diameter of twenty-two feet. The radius arm, which turns on a center pivot bearing directly over the center of the propeller hub, is graduated in inches beginning at the hub center.

The drawing arrangement, made to reproduce the propeller blade surfaces on paper, is mounted on a carriage along with large rolls containing the drawing paper. The carriage is moved by hand on the radius arm in a direction from propeller hub center to the propeller blade tips.

The carriage also holds a vertical indicator which slides downward through the carriage and contacts the propeller blade surfaces. The vertical movements of the carriage indicator are transmitted through mechanical connections to a pencil, which records all its movements on the paper rolls containing the drawing paper.

The drawing paper rolls on the carriage are arranged to roll in the direction the carriage is moved on the radius arm, thus making radial lines on the drawing paper from hub to propeller blade tip. The rolls are also arranged to draw arcs of the blade surface from leading to following edge, which is done on both the driving face and the back of the propeller blade. The lines are made on the drawing paper when the carriage is moved on the radius arm, and the radius arm is swung in an arc across the propeller blade.

After the diagram is completed in full size it is removed from the roll and laid out on a drawing table for examination. The drawing shows all defects, which are then corrected by drawing in red lines to indicate how much metal must be chipped or ground off the blade surfaces. The diagram is then replaced on the rolls the same as before and the irregular blade surfaces are trued to the corrected red lines made on the drawing board.

Propeller Club Port of Tacoma

The first regular meeting of the new season of the Propeller Club, Port of Tacoma, was held Tuesday evening, September 16th, 1941, at the Tacoma Hotel.

A good representation was on hand to enjoy the cocktail hour starting at 6:30 p.m. and the very fine dinner at 7:15 p.m. Immediately after dinner, a number of guests, prospective members of the Propeller Club, were introduced to the Club by President Gil Ackerman.

The first matter brought before the Club was the regular place of meeting. Because of the increasing costs incurred it has been found impossible to continue at the present location and another suitable location for our monthly meetings has to be found. It was decided to leave this matter to members of the Board of Governors who will endeavor to find a satisfactory meeting place at their next meeting.

The speaker of the evening, Captain Harvey Jeans, manager of the Chartering Dept. for the General Steamship Corporation in Seattle, was introduced to the members and guests by our president and gave a particularly interesting and timely talk in this connection. He gave the history of the charter from its beginning and described in detail the various kinds of charters now in effect.

A good many questions were asked of Captain Jeans in regard to the subject of charters and other ship problems, after which the meeting was adjourned.

Chas. C. Cramp
Secretary

Chile Tribute . . .

Luncheon sessions of the Foreign Trade Association of the San Francisco Chamber of Commerce will be resumed Monday (September 29) with a program founded upon Chile's position in the Western Hemisphere.

Guests of honor at the event will be Mario Illanes, consul of Chile in San Francisco since 1935; Prof. Ernesto Salzmann, chairman of the committee on Latin American cultural relations of the San Francisco Chapter, Pan American Society; and Fernando Contreras, San Francisco Junior College exchange student from Chile.

Launching the U. S. S. Massachusetts, September 23, at the Fore River shipyards in Quincy, was a thrill for these workers at General Electric's Lynn (Mass.) River Works who helped equip the 35,000-ton dreadnaught with propulsion gears. Radio broadcast of the ceremonies was brought to them during the lunch hour via a set installed in the shop, while more than 1000 co-workers gathered for the program in the Works auditorium. At the same time, engineers at G-E's Works in Schenectady who designed the turbines for the ship's propulsion equipment also listened as a group to the launching ceremonies. . . . The G-E workers were commended for producing machinery for the $75,000,000 craft many weeks in advance of schedule. The same workmen produced the 115,000-horsepower propulsion sets for three other ships of the same class—the North Carolina and the Washington, already commissioned, and the South Dakota, launched June 7—and are working on equipment for two more 35,000 tonners now under construction.

Newport News Appointments

Newport News Shipbuilding and
Dry Dock Company

Newport News Virginia

Mr. B. N. DeRochie,
Pacific Marine Review,
500 Sansome Street,
San Francisco, Calif.

My dear Mr. DeRochie:

We have made some recent changes in the organizations of our Engineering Department, involving appointments as follows:

John F. Nichols, Director of Engineering

Frank R. Benson, Chief Engineer

Roger V. Terry, Assistant Chief Engineer

I am enclosing brief outline of careers of these men for yours news section.

Yours very truly,

E. G. Rogers
Sales Representative

John F. Nichols, Director of Engineering. Mr. Nichols was born on June 10, 1873, in Bay City, Mich. He received the degree of Bachelor of Science in Mechanical Engineering from the University of Michigan in June, 1895, and received practical training as a machinist at the shipyard of F. W. Wheeler & Company, West Bay City, Mich., and as an oiler aboard vessels on the Great Lakes. He was first employed by the Newport News Shipbuilding and Dry Dock Company as a draftsman in September, 1898, becoming chief engineering draftsman in 1908 and assistant chief engineer in 1913. Mr. Nichols was chief engineer of this company from March, 1918, to June 1, 1941, director of engineering since June 1, 1941. He was a member of the United States Shipping Board Diesel Advisory Committee from 1924 to 1925 and is a civil member of the American Society of Naval Engineers, a member of the North-East Coast Institution of Engineers and Shipbuilders, a member of the special sub-committee on Marine Engineering of the American Bureau of Shipping and a council member of the Society of Naval Architects and Marine Engineers.

Frank R. Benson, Chief Engineer. Mr. Benson was born October 2, 1890, in Portsmouth, Virginia. He received from the Virginia Polytechnic Institute the degree of Bachelor of Science in Mechanical Engineering in 1911 and degree of Mechanical Engineer in 1912. He was employed in the drafting rooms and shops of the Air-Tight Steel Tank Company of Pittsburgh, Penna., from 1912 to 1915. He entered the engineering drawing rooms of the Newport News Shipbuilding and Dry Dock Company in 1915, becoming chargeman in 1918, assistant hydraulic engineer in 1922, hydraulic engineer in 1926, assistant chief engineer in 1929 and chief engineer June 1, 1941. He is a member of the Society of Naval Architects and Marine Engineers, American Society of Naval Engineers, and the Propeller Club.

Roger V. Terry, Assistant Chief Engineer. Mr. Terry was born on January 22, 1898, in Pittsylvania County, Virginia. He attended the University of Richmond 1914-15 and the North Carolina State College 1915-18. From the latter he received the degrees of Bachelor of Engineering in 1918, Mechanical Engineer in 1921, and honorary degree of Doctor of Engineering in 1941. In the summer of 1917 he worked as an engineering apprentice with the Westinghouse Machine Company at East Pittsburgh, Penna. Upon graduation from college he attended the Field Artillery Central Officers' Training School, Camp Taylor, Louisville, Kentucky, graduating and receiving his reserve commission in December, 1918. He entered the employ of the Newport News Shipbuilding and Dry Dock Company in January, 1919, as a draftsman, becoming chargeman in 1922, assistant engineer in 1923, assistant hydraulic engineer in 1926, hydraulic engineer in 1929, and assistant chief engineer in July, 1941. He is a member of the American Society of Mechanical Engineers, the American Society of Naval Engineers, and the Propeller Club.

Dan Lyons, Calif. Visitor

Dan Lyons, executive vice-president of the Colby Steel & Engineering Company, has just completed a trip through California shipyards where he inspected Colby Luffing boom type shipyard cranes. At the present time over eighty of these massive Colby cranes are in service, or in process of erection in the State of California alone.

While in San Francisco he made his headquarters with George Swett & Company, California representatives of the Colby Steel & Engineering Company.

John Raymond, President of the recently organized Associated Products, Inc., 275 W. Market St., Akron, Ohio, announces the formation of a commercial division which will manufacture Akron electric ranges for restaurants, hotels, institutions and the Marine field. Wm. H. Sickinger has joined the company as vice president in charge of this division. Mr. Sickinger, a well-known designer and electrical engineer, has been associated with The Rutenber Electric Co., Standard Electric Range Mfg. Co., Crown Store Works and Malleable Steel Range Mfg. Company, in household and commercial electric range design and development. He has also served as engineering consultant to numerous nationally known companies.

PROGRESS IN *American Shipyards*

★ Asterisk indicates new listings.

PACIFIC COAST SUMMARY

Seagoing Self-propelled Steel Ships

District and Shipyard	*No. and Type*
PUGET SOUND DISTRICT	
Associated Shipbuilders	4 seaplane tenders
Lake Washington Shipyards	4 A. S. N. T. 1 survey ship 6 seaplane tenders
Seattle Shipbuilding and DD. Co.	4 mine sweepers
Seattle-Tacoma (Tacoma Yard)	1 C-1 36 C-3 5 TI-MT-MI tankers
Seattle-Tacoma (Seattle Yard)	25 destroyers
COLUMBIA RIVER DISTRICT	
Albina Eng. & Mach. Works, Inc.	4 subchasers
Commercial Iron Works	4 A. S. N. T. 7 mine sweepers
Oregon Shipbuilding Corp.	43 EC-2
Willamette Iron & Steel Co.	2 mine layers
SAN FRANCISCO BAY DISTRICT	
Anderson & Christofani	6 coastal mine sweepers
Basalt Rock Co., Inc.	2 fuel oil tankers
Bethlehem Steel Co.	25 destroyers 4 cruisers
General Engineering & DD. Co.	2 A. S. N. T. 8 mine sweepers
Moore Dry Dock Corp.	3 C-3-P 2 sub-tenders 18 C-2
Richmond Shipbuilding Corp.	24 EC-2
Todd-California SB. Corp.	30 cargo vessels (British)
United Engineering Co. Ltd	8 Navy fleet tugboats
Western Pipe & Steel Co.	23 C-3
LOS ANGELES DISTRICT	
Bethlehem Steel Co., Inc.	10 destroyers
California Shipbuilding Corp.	55 EC-2
Consolidated Steel Corp. Ltd.	33 C-1-BT 46 lighters 2 P1-S2-L2
Los Angeles SB. & DD. Corp.	3 repair vessels 3 seaplane tenders

Pacific Coast

ALBINA ENGINE & MACHINE WORKS, INC.

Portland, Oregon

New Construction:

Hulls Nos. 51-54, four 165′ steel submarine chasers for U. S. Navy.

ANDERSON & CHRISTOFANI

San Francisco, Calif.

New Construction:

Six 97′ AMC coastal mine sweepers for U. S. Navy.

One 48′ yacht for Herman Hogrefe. **Completed.**

One 60′ purse seiner for S. Piazza.

ASSOCIATED SHIPBUILDERS

Seattle, Wash.

New Construction:

One insulated self-propelled lighter for delivery to U. S. Navy at Puget Sound Navy Yard.

Four small seaplane tenders for delivery to Puget Sound Navy Yard.

ASTORIA MARINE CONSTRUCTION CO.

Astoria, Ore.

New Construction:

Four 135′ wooden diesel-powered mine sweepers for U. S. Navy. Delivery in 14 months.

BASALT ROCK CO., INC.

Shipbuilding Yard—Napa, Calif.

New Construction:

Twelve steel seagoing 1000-ton cargo barges; contractors, Pacific Navy Air Bases. Delivery at San Francisco Bay. 150′ x 40′ x 12′. Contract awarded November 15, 1940. **Last one delivered August 6, 1941.**

Hulls Nos. 22-23, two 10,000-bbl. fuel oil tankers, for delivery to Mare Island Navy Yard. 235′ x 37′ x 19′3″; 1000-hp diesel electric; cost $1,800,000. Contract awarded by Navy Dept., Bureau of S. & A., Washington, D. C. Keel laying dates, No. 22, June 20, 1941; No. 23, August, 1941. **Launching dates, No. 22, October, 1941;** No. 23, December, 1941. Delivery dates, No. 22, January 30; No. 23, May 30, 1942.

Hull No. 28, self-propelled lighter for U. S. Navy. 132′6″ x 30′ x 12′4″; 300-hp diesel; 500 gross tons; cost $370,000. Delivery date, February 15, 1942.

Hulls Nos. 29 and 34, two open lighters for U. S. Navy. 110′ x 34′ x 11′3″; 500 gross tons; cost $216,000. Delivery date, November 15, 1941.

Hulls Nos. 35-36, two open lighters for Navy Contractors. 144′ x 40′ x 13′; 750 gross tons; cost $128,000. **Delivered.**

Hulls Nos. 37-38, two open lighters for Navy Contractors. 124' x 36' x 10'; 450 gross tons; cost $102,000. Delivery date, **October 1, 1941.**

BERKELEY STEEL CONSTRUCTION CO.
Berkeley, California

New Construction:

One all-welded utility diesel-electric stern wheeler for U. S. Engineers. 102' x 26' x 5'. Cost $114,800.

BELLINGHAM MARINE RAILWAY & BOATBUILDING COMPANY
Bellingham, Wash.

New Construction:

Hulls Nos. 17-20, four mine sweepers for the U. S. Navy. Keel laying dates, No. 71, July 16; No. 18, July 22; No. 19, July 26; No. 29, July 31, 1941.

BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Division—San Francisco Yard
San Francisco, Calif.

New Construction:

Hulls Nos. 5363-5364, two C-1 cargo vessels for U. S. Maritime Commission. 395' x 60' x 37'6"; 6400 gross tons each; 4000-hp. Full scantling steam propulsion type. Keel laid, No. 5364, January 15, 1941. Launching dates, No. 5363, March 12, 1941; No. 5364, July 3, 1941. **Delivery dates, No. 5363, August 11; No. 5364, September 12, 1941.**

Hulls Nos. 5368-5383, sixteen 2100-ton destroyers, DD526-DD541.

Hulls Nos. 5366-5367, two 1650-ton destroyers, DD459-DD460, for U. S. Navy. Keels laid January 13, 1941.

Hulls Nos. 5390-5396, seven 1620-ton destroyers, DD605 - DD611. Keel laying dates, Nos. 5390, 5391, March 25 and 28, 1941.

Hulls Nos. 5386-5389, four 6000-ton cruisers, CL95-CL98. Keel laying dates, No. 5386, July 13; No. 5387, August 1, 1941.

BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Division—San Pedro, Calif.

New Construction:

Hulls Nos. 9001-9004, four 2100-ton destroyers, DD544-DD547.

Hulls Nos. 9007-9012, six 1620-ton destroyers, DD612-DD617. Keel laying dates, Nos. 9007, 9008, May 1, 1941; Nos. 9009, 9010, May 29, 1941.

BIRCHFIELD BOILER CO., INC.
Tacoma, Washington

New Construction:

One U. S. Coast Guard Cutter for Columbia River and Snake River.

N. J. BLANCHARD BOAT CO.
Seattle, Washington

New Construction:

One sloop, 52' x 11½', 50-hp gas engine.

Three 45' aircraft tenders or rescue boats for the U. S. Navy.

CALIFORNIA SHIPBUILDING CORP.
Wilmington, California

New Construction:

Hulls Nos. 1-55, fifty-five EC-2 type cargo vessels for U. S. Maritime Commission. Ten keels laid up to Sept. 15, 1941.

CAMPBELL MACHINE CO.
San Diego, Calif.

New Construction:

Hull No. 69, 450-ton fishing boat for A. Tavaras & Co., 110'x26'x12'; 350-hp Union diesel. Cost $170,000. Keel laid June 1, 1941. **Launching date, October 1, 1941.**

Hull No. 70, 550-ton fishing boat for G Vattuone & Co. 128'x12' 6"; 500-hp Union diesel. Cost $210,000. Keel laid June 15, 1941. Launching date, November 1, 1941.

COLBERG BOAT WORKS
Stockton, Calif.

New Construction:

Three large wooden mine sweepers for U. S. Navy.

COMMERCIAL IRON WORKS
Portland, Ore.

New Construction:

Four anti-submarine net tenders. Delivery to be completed September, 1942.

Seven steel mine sweepers for U. S. Navy.

CONSOLIDATED STEEL CORP., LTD.
Los Angeles, Calif.

New Construction:

Hulls Nos. 156, Agwimonte; 157, Aguiprince; 158, Alcoa Pennant; 159, 222-225, eight C-1-BT, full scantling, turbine propulsion cargo vessels for U. S. Maritime Commission. Keel laying dates, No. 159, April 7; No. 222, November 20; No. 223, November 25; No. 224, December 20; No. 225, December 29, 1941. **Launching dates,** No. 157, March 27; No. 158, June 26; No. 159, **September 27, 1941;** No. 222, March 30; No. 223, April 17; No. 224, May 4; No. 225, May 22, 1942. **Delivery dates, No. 156, September 15; No. 157, October 15;** No. 158, November 6; No. 159, December 23, 1941; No. 222, July 30; No. 223, August 17; No. 224, September 4; No. 225, September 22, 1942.

Hulls Nos. 206-207, two, Design P1-S2-L2 twin screw turbine propulsion transports for U. S. Maritime Commission.

FELLOWS & STEWART, INC.
Wilmington, California

New Construction:

One 100' V-bottomed kelp harvester.

Two 45' taxi boats.

★ **Six landing floats** for California Shipbuilding Co., Terminal Island. Two, 25'x65'; one 25'x60'; three 12'x60'.

F. L. FULTON
Antioch, Calif.

New Construction:

Six 97' wooden mine sweepers for U. S. Navy.

GEN. ENGINEERING & DRY DOCK CO.
Alameda, Calif.

New Construction:

Four anti-submarine net tenders for U. S. Navy. First, Buckthorn, delivered August 21, 1941.

Eight mine sweepers for U. S. Navy.

HARBOR BOAT BUILDING CO.
Terminal Island, Calif.

New Construction:

Six 60-foot U. S. Navy target boats. Delivery dates, one, September 5; one September 12; two September 25.

Hulls Nos. 117-120, four 136' motor mine sweepers for U. S. Navy. Keels laid, No. 117, May 8, 1941; No. 118, May 12, 1941; No. 119, July 15, 1941; No. 120, August 23, 1941. Launched No. 117, August 23, 1941.

HUBBARD'S SOUTH COAST COMPANY
Newport Beach, California

New Construction:

Four 45' twin-screw aircraft tenders for U. S. Navy.

Six 135' mine sweepers for U. S. Navy.

KRUSE & BANKS SHIPBUILDING CO., INC.
North Bend, Oregon

New Construction:

Hulls Nos. 121-124, four 135' wooden mine sweepers, YMS type, for U. S. Navy. Cost $1,800,000.

LAKE WASHINGTON SHIPYARDS
Houghton, Wash.

New Construction:

Four anti-submarine net tenders.

Four thousand A. S. N. T. floats.

Coast and Geodetic Survey ship.

Six seaplane tenders for U. S. Navy.

AL LARSON BOAT SHOP, INC.
Terminal Island, Calif.

New Construction:

Hulls Nos. 112-113, two mine sweepers, YMS 86 and YMS 87, for U. S. Navy. Keels laid, No. 112, June 20; No. 113, July 18, 1941. Delivery dates, No. 112, November 27, 1941; No. 113, March 27, 1942.

LOS ANGELES SHIPBUILDING & DRY DOCK CORP.
Los Angeles, Calif.

New Construction:

Hulls Nos. AR6-AR8, three repair vessels for U. S. Navy.

Hulls Nos. AV 11-AV 13, three seaplane tenders for U. S. Navy.

MOORE DRY DOCK CO.
Oakland, Calif.

New Construction:

Hulls Nos. 201-203, three cargo and passenger vessels for U. S. Maritime Commission and Alcoa Steamship Co. 442'x62'x25'; depth molded to bridge deck 41'6"; 8500 hp; 17 knots speed; passenger carrying capacity 38. Keel laying dates, March 26, June 3 and August 6, 1941. Estimated delivery dates, January 1, March 15 and June 1, 1942.

Two submarine tenders for U. S. Navy. **Hull laid for one, September 15, 1941.**

Five submarine rescue vessels for U. S. Navy. **Hull laid for one, September 15, 1941.**

Six C-2 cargo vessels.

Twelve C-2 cargo vessels.

Conversion:

Hull No. 195, U. S. S. Tangier, to seaplane tender for U. S. Navy. **Delivered August 29, 1941.**

OLSON & WINGE MARINE WORKS
Seattle, Wash.

New Construction:

Hulls Nos. 40-45, six 40' motor sailers for U. S. Army. **Keels laid, three, September 15, 1941.**

Conversions:

Five for the U. S. Army. Total cost, $50,000.

OREGON SHIPBUILDING CORP.
Portland, Oregon

New Construction:

Hulls Nos. 170-200 and 229-240, forty-three EC-2 type cargo vessels for U. S. Maritime Commission. Keel laying dates, No. 170 and No. 171, May 19; No. 172 and No. 173, May 31; No. 174, July 11; No. 175, No. 176 and No. 177, July 18, 1941.

PACIFIC BRIDGE CO.
San Francisco, Calif.

New Construction:

One seagoing drydock for U. S. Navy. Cost $1,649,000.

PACIFIC DRY DOCK & REPAIR CO.
Oakland, Calif.

New Construction:

One all-welded steel oil barge. 148' x 38' x 9'; 300,000 gal. capacity.

Lighters. Cost $284,572.

RICHMOND SHIPBUILDING CORP.
Richmond, Calif.

New Construction:

Hulls Nos. 41-64, twenty-four EC-2 type cargo vessels for U. S. Maritime Commission

Keel laying dates, No. 41, No. 42 and No. 43, September 17; No. 44, September 20; No. 45, September 25; No. 46, September 30; No. 47, October 31, 1941.

SAN DIEGO MARINE CONST. CO.
San Diego, Calif.

New Construction:

Four large wooden mine sweepers for U. S. Navy.

SEATTLE SHIPBUILDING AND DRY DOCK CO.
Seattle, Wash.

New Construction:

Four 136′ mine sweepers for U. S. Navy.

SEATTLE-TACOMA SHIPBUILDING CORP.
Tacoma, Wash.

PLANT No. 1

New Construction:

Hull No. 5, Idaho; C-1 cargo vessel for U.S. Maritime Commission. Single screw, full scantling diesel propulsion type. Two General M. A. N. 2100-hp engines; 14 knots speed. Launched, June 10, 1941. **Delivered, September, 1941.**

Hulls No. 6, Frederick Funston; No. 7, James O'Hara, two C-3 shelter deck type cargo steamers for U. S. Maritime Commission. To be converted on completion to U. S. Army troopships. Keel laying dates, April 21 and June 16, 1941. Launching dates, **September 27, 1941,** and January 12, 1942.

Hulls Nos. 8-11, four C-3 cargo ships for U. S. Maritime Commission. 492′ x 69′6″ x 42′6″ (molded); 8900 tons; 8500-hp steam turbine propulsion; cost $2,990,000. **Keel laying dates, June 18, September 29,** November 1 and 5, 1941. **Launching dates, October 22, 1941;** February 12 and 28, and March 1, 1942. Delivery dates, No. 8, February; No. 9, May; No. 10, June, No. 11, June, 1942.

Hulls Nos. 12, Patapsco; 13, Rappahannock; 14, Rio Grande; 15, Wabash; 16, Susquehanna; five TI-MT-MI tankers for U..S. Navy. 310′9″ x 48′6″ x 19′9′. Keel laying dates, No. 12, February 15; No. 13, March 1; No. 14, May 15; No. 15, June 1; No. 16, June 2, 1942. Launching dates, No. 12, May 27; No. 13, May 28; No. 14, August 12; No. 15, August 27; No. 16, August 28, 1942. Delivery dates, No. 12, August 30; No. 13, September 1; No. 14, November 30; No. 15, November 30; No. 16, December 1, 1942.

Hulls Nos. 17-46, thirty C-3 cargo vessels for U. S. Maritime Commission. 492′ x 69′6″ x 42′6″; 8900 tons; 8500-hp steam turbine propulsion. Delivery dates, first, June, 1942; last, October, 1943.

SEATTLE PLANT

New Construction:

Twenty-five destroyers for U. S. Navy.

THE SHAIN MANUFACTURING CO.
Seattle, Washington

New Construction:

One 65′ ferryboat for U. S. Navy.

One model 30 trimmer ship Air Flo sedan for Chas. Cole, Seattle; Chrysler Crown.

One model 36 trimmer ship Air Flo sedan for Paul Isaacson, Seattle; Chrysler Crown.

One model 50 trimmer ship ferry for Horluck Trans. Co., 110-hp Buda diesel.

One model 49 trimmer ship, express cruiser, for stock.

One 50′ commodore model trimmer ship for E. Ramey.

One 38′ sedan trimmer ship for U. S. Customs.

STEPHENS BROS.
Stockton, Calif.

New Construction:

Three large wooden mine sweepers for U. S. Navy.

TODD-CALIFORNIA SHIPBUILDING CORP.
Richmond, Calif.

New Construction:

Thirty cargo vessels for British Purchasing Commission. 10,000 dwt; 416′ long, 57′ beam. Cost $50,000,000. First vessel, Ocean Vanguard, launched August 16, 1941.

TODD-SEATTLE DRY DOCKS
Seattle, Wash.

Conversion work.

UNITED ENGINEERING CO., LTD.
San Francisco, Calif.

New Construction:

Hulls Nos. 17-20, four 205′ Navy fleet tugboats, for U. S. Navy.

Hulls Nos. 21-24, four 205′ Navy fleet tugboats, for U. S. Navy.

WESTERN BOAT BUILDING CO., INC.
Tacoma, Wash.

New Construction:

Hull No. 145, Anna M., live bait tuna boat. Launching date, April 5, 1941. **Delivery date, September 1, 1941.**

Hull No. 146, fishing boat, 95′ x 24′ x 11′. Keel laid April 15, 1941.

Hulls Nos. 147-148, two U. S. Minesweepers, Y.M.S. 133-Y.M.S. 134. Keel laying dates, No. 147, June 23, 1941; No. 148, August 12, 1941.

★ **Hull No. 146, boat** purchased by Army Quartermaster General. 95′x24′x11′ 1″. Delivery date, November 1, 1941.

WESTERN PIPE AND STEEL CO.
South San Francisco, Calif.

New Construction:

Hull No. 61, C-1 cargo vessel for U. S. Maritime Commission. Full scantling diesel propulsion type; single screw; two Busch-Sulzer 2100-hp engines. Delivery date, **September 13, 1941.**

Hulls Nos. 62-65, 77-95, twenty-three C-3 cargo ships for U. S. Maritime Commission. 492′ x 69′ x 42′6″; 8900 tons; 8500-hp; steam propulsion; $2,990,000 each. **Keel laying dates,** No. 62, April 17; No. 63, May 29; No. 64, July 17; **No. 65, September 30, 1941. Launching dates, No. 62, about October 1.**

WILLAMETTE IRON & STEEL CORP.
Portland, Ore.

New Construction:

Two minelayers, CM6, U. S. S. Catskill, and CM7, U. S. S. Ozark, for U. S. Navy.

Atlantic, Lakes, Rivers

ALABAMA DRY DOCK & SHIPBUILDING CO.
Mobile, Ala.

New Construction:

Hulls Nos. 228-229, two tugs for Mobile Towing & Wrecking Co.

Hull No. 230, tug, for stock.

Hulls Nos. 231-243, thirteen all-welded Emergency cargo vessels for U. S. Maritime Commission. Cost $19,500,000.

Hull No. 244, 18,000-ton floating dock, for Todd Shipyards Corp., Galveston.

LESTER F. ALEXANDER CO.
New Orleans, La.

New Construction:

One tug, North Star. 68′x17′. 300-hp Cooper-Bessemer engine.

Two tugs, Trade Wind and Fair Wind. 68′x17′. 220-hp Atlas-Bessemer engine.

★ **One 400 type barge** for stock. 120′x32′x8′.

★ **Six barges** for U. S. Engineers, Philadelphia, Pa. Four, 50′x20′x5′; two, 92′x26′x6′.

★ **One barge for stock.** 150′x34′x9′ 6″- 8′ 6″.

AMERICAN BRIDGE COMPANY
Pittsburgh, Pa.

New Construction:

Eight dump scows. 160′ x 50′6″ x 13′6″; for Panama Canal.

Ten coal barges for stock. 175′ x 26′ x 11′.

Sixteen sand barges for the Panama Canal. 160′ x 50′6″ x 13′6″.

★ **Sixty coal barges** for Carnegie-Illinois Steel Corp. 175′x26′x11′.

★ **Five barges** for U. S. Engineers Office, Panama Canal District. 126′x26′x11′.

AMERICAN CAR & FOUNDRY CO.
Wilmington, Delaware

New Construction:

Thirty-eight 45′ lighters, equipped with tanks for carrying liquids, for U. S. Navy. Total cost $1,020,262.

Four 135′ mine sweepers for Navy Dept., Bureau of Supplies and Accounts. Total cost $1,340,000.

THE AMERICAN SHIP BUILDING CO.
Cleveland, Ohio

New Construction:

Twelve net tenders for U. S. Navy; (6 at Lorain, Ohio; 6 at Cleveland, Ohio). 151′8″ x 30′6″ x 16′6″; diesel-electric propulsion; contract price $6,357,000. **Four delivered as of September 2, 1941.**

Four diesel trawlers for General Seafoods Corp. 146′8″ L. O. A. x 26′0″ x 14′4″. (2 at Lorain, Ohio; 2 at Cleveland, Ohio.) Delivery date, November 15, 1941.

Eight mine sweepers (4 at Lorain, Ohio; 4 at Cleveland, Ohio) for U. S. Navy; 220′ O.A. x 32′ x 17′; diesel-electric propulsion; contract price, $13,736,000.

Two bulk freighters (at Lorain, Ohio) for Pittsburgh Steamship Company; 640′ O.A. x 67′ x 35′; geared-turbine propulsion. **Delivery date, October 1, 1942.**

Fifteen 2500-ihp, three cylinder triple expansion engines for Maritime Commission design EC2-S-C1 cargo vessels.

BATH IRON WORKS
Bath, Maine

New Construction:

Hulls Nos. 184 (Exceller) 187, four cargo ships for American Export Lines. 400′ x 60′x39′. **Delivery dates, No. 184, August 14; No. 185, October, 1941; No. 186, April; No. 187, June, 1942.**

Hulls Nos. 188-189, DD457 and DD458, two destroyers for U. S. Navy. Delivery dates December, 1941, and February, 1942.

Hulls Nos. 190-195, DD449-451, 467-469, six destroyers for U. S. Navy.

Hulls Nos. 196-206, DD507-DD517, eleven destroyers for U. S. Navy.

Hulls Nos. 208-213; DD629-DD631; DD 642-DD644; six destroyers for U. S. Navy.

BETHLEHEM STEEL COMPANY
Shipbuilding Division—Fairfield Yard

Baltimore, Md.

New Construction:

Hulls Nos. 2001-2062, sixty-two EC-2 type cargo vessels, for U. S. Maritime Commission. **Keel laying dates,** No. 2001, March 30; No. 2002, May 15; No. 2003, June 21; No. 2004, June 21; No. 2005, July 15; No. 2006, July 15; No. 2007, August 15; No. 2008, August 25; **No. 2009, September 3; No. 2010, September 12, 1941.**

BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Division—Fore River Yard

Quincy, Mass.

New Construction:

Hull No. 1478, Massachusetts, 35,000-ton battleship for U. S. Navy. Keel laid July 20, 1939.

Hulls Nos. 1479, San Diego; and 1480, San Juan; two 6000-ton cruisers for U. S. Navy. Keels laid March 27 and May 15, 1940. Launching date, No. 1479, July 26. No. 1480, September 6, 1941.

Hull No. 1484, cargo vessel for U. S. Maritime Commission. 450′ x 66′ x 42′3″; 16½ knots; geared turbines and water tube boilers; 14,500 tons. Launching date November 16, 1940.

Hulls Nos. 1489-1491, three tankers for Sinclair Refining Co., 10,700 tons dwt. Keels laid, No. 1489, March 18, 1941; No. 1490, May 31, 1941. Launching date, No. 1489, August 7, 1941.

Hulls Nos. 1492-1493, two tankers for Sinclair Refining Co. 15,450 tons dwt. Keel laying date, No. 1492, August 9, 1941.

Hulls Nos. 1494-1497, four heavy cruisers for U. S. Navy. **Keel laying dates,** No. 1494, May 26; No. 1495, June 30; **No. 1496, September 3, 1941.**

Hulls Nos. 1498-1501, four light cruisers for U. S. Navy.

Hulls Nos. 1502-1503, two light cruisers for U. S. Navy.

Hulls Nos. 1504-1507, four heavy cruisers for U. S. Navy.

Hulls Nos. 1508-1511, four aircraft carriers for U. S. Navy. Keel laying date, No. 1508, July 15, 1941.

Hulls Nos. 1513-1515, three trawlers. Keels laid, No. 1513, March 26; No. 1514, June 14; No. 1515, July 12, 1941. Launching dates, No. 1513, July 10, 1941.

Hulls Nos. 1516-1519, four 1650-ton destroyers for U. S. Navy. Keel laying date, No. 1516, May 1; No. 1517, May 20, 1941.

BETHLEHEM STEEL COMPANY, INC.

Shipbuilding Div.—Sparrows Point Yard
Sparrows Point, Md.

New Construction:

Hull No. 4348, C-1 cargo vessel. LOA 416′, LBP 395′, beam 60′, depth 37′6″. Keel laid March 13, 1941.

Hulls Nos. 4351-4352, two cargo vessels for Seas Shipping Co. 450′ x 66′ x 34′; 6300 hp; 8500 gross tons. Keel laying dates, No. 4351, December 12, 1940; No. 4352, January 22, 1941. Launching date, No. 4351, July 26, No. 4352, August 29, 1941.

Hulls Nos. 4353-4356, four oil tankers for Socony Vacuum Oil Co. 487′6″ x 68′ x 37′; 12,000 hp, 9800 gross tons. Keel laying dates, No. 4353, August 12, 1940; No. 4354, September 16, 1940; No. 4355, April 23; No. 4356, July 8, 1941. Launching date, No. 4353, April 19; No. 4354, July 1. Delivery date, **No. 4353, August 18, 1941.**

Hull No. 4357, oil tanker for Union Oil Co. of Calif. 442′ x 64′ x 34′10″; 3500 hp; 8000 gross tons. Keel laying date, December 26, 1940. Launched June 14. Delivered, **No. 4357, August 22, 1941.**

Hulls Nos. 4358-4359, two oil tankers for Socony Vacuum Oil Co. 487′6″ x 68′ x 37′; 12,000 hp; 9800 gross tons.

Hulls Nos. 4360-4361, two oil tankers for Union Oil Co. 442′ x 64′ x 34′10″; 3500 hp; 8000 gross tons. Keel laying date, No. 4360, June 18, 1941.

Hulls Nos. 4362-4364, three cargo and passenger vessels for Mississippi Shipping Co. 465′ x 65′6″ x 39′9″; 7800 hp; 8300 gross tons.

Hull No. 4365, oil tanker for Richfield Oil Co. 442′ x 64′ x 34′10″; 3500 hp; 8000 gross tons. Keel laid May 21, 1941.

Hulls Nos. 4367-4368, two oil tankers for Panama Transport Co. 487′6″ x 68′ x 37′; 7000 hp; 9800 gross tons.

Hull No. 4369, oil tanker for Continental Oil Co. 442′ x 64′ x 34′10″; 3500 hp; 8000 gross tons.

Hulls Nos. 4371-4372, two oil tankers for Gulf Oil Co. 442′ x 64′ x 34′10″.

Hull No. 4373, tanker for Panama Transport Co. 487′6″ x 68′ x 37′; 7000 hp; 9800 gross tons.

Hulls Nos. 4374-4375, two tankers for Union Oil Co. of Calif. 487′6″ x 68′ x 37′; 7000 hp; 9800 gross tons.

Hulls Nos. 4376-4377, two tankers for Socony Vacuum Oil Co. 487′6″ x 68′ x 37′; 4800 hp; 9800 gross tons.

BETHLEHEM STEEL COMPANY, INC.

Shipbuilding Div.—Staten Island Yard
Staten Island, N. Y.

New Construction:

Hulls Nos. 8021-8022, two destroyers for U. S. Navy.

Hulls Nos. 8023-8029; 8033-8035; ten destroyers for U. S. Navy.

BURGER BOAT CO.

Manitowoc, Wisconsin

New Construction:

One yacht, 65′x16′x8′, Buda diesel engine.

One ferryboat, 110′ x 32′ x 8′, 330-hp Gray diesel engine.

Six 135′ wooden motor mine sweepers for U. S. Navy.

IRA S. BUSHEY & SONS, INC.

Brooklyn, N. Y.

New Construction:

Hull No. 497, tug. 90′; 805-hp F-M diesel. **Delivery date, September, 1941.**

Hull No. 498, 156-foot oil tanker. Delivery date, November, 1941.

Hull No. 499, 156-foot oil tanker. Delivery date, January, 1942.

Hull No. 500, wooden drydock section for Bethlehem Steel Co. Delivery date, October, 1942.

Hulls Nos. 503-504, two 100′ steel tugs. 805-hp.

Hulls Nos. 505-506, two drydocks, for U. S. Navy.

Hulls Nos. 507-509, three 100′ steel tugs, for U. S. Navy. 805 hp.

CALUMET SHIPYARD & DRY DOCK CO.

Chicago, Illinois

New Construction:

Hull No. 123, towboat for Ashland Oil & Refining Co., 140′ x 32′ x 9′, 1600-hp diesel engine.

One river towboat for A. L. Meschling Barge Line, 70′ x 20′, 210 hp Superior diesel.

One all-welded Corten steel crawler crane barge, for U. S. Engineers Office, St. Paul, Minn., 66′ x 45′ x 7′.

Four all-welded distribution box boats for Quartermaster Corps., U. S. Army, 65′ x 18′, diesel propelled. Total cost $212,000.

Hull No. 126, all-welded steel towboat for Ashland Oil Refining Co., 145′ x 32′ x 9′, 1600-hp diesel.

Hulls Nos. 131-132, two oil barges, standard river type, for Ashland Oil & Refining Co. 195′ x 35′ x 10′.

Hulls Nos. 133-135, one three-barge unit for Ashland Oil & Refining Co. Each unit, 195′ x 35′ x 10′; center section square on both ends; both end sections square on one end, raked on opposite end.

Hull No. 136, one river towboat for Ashland Oil & Refining Co. 245′ x 32′ x 90′. 1600-hp diesel.

CHARLESTON SHIPBUILDING & DRYDOCK COMPANY

Charleston, South Carolina

New Construction:

Eight 205′ mine sweeping fleet tugs. Delivery for all within 29 months.

CONSOLIDATED SHIPBUILDING CORP.

Morris Heights, N. Y.

New Construction:

Seven 165′ steel submarine chasers for U. S. Navy.

CONSOLIDATED STEEL CORP. OF TEXAS

Orange, Texas

New Construction:

Two oil barges for C. F. Pillot, 165′ x 36′ x 10′3″.

Six all-welded steel oil barges for Inland Waterways Corp., 196′ x 35′ x 10′6″.

One drilling barge for Shell Oil Co., Inc., 118′ x 44′ x 10′.

One boiler barge for Shell Oil Co., Inc., 90′ x 30′ x 10′.

One transportation barge for Shell Oil Co., Inc. 80′ x 24′ x 5′.

Three transportation barges for Shell Oil Co., Inc. 40′ x 16′ x4′6″.

CRAMP SHIPBUILDING COMPANY

Philadelphia, Pa.

New Construction:

Six cruisers, Cleveland class, for U. S. Navy.

DEFOE BOAT & MOTOR WORKS

Bay City, Mich.

New Construction:

Hull No. 167, PC452, sub-chaser for U. S. Navy. 174′ long Delivery date, September, 1941.

Hulls Nos. 171-174, four mine sweepers for U. S. Navy, 220′ long.

Hulls Nos. 175-186, twelve 174′ escort vessels for U. S. Navy.

Hulls Nos. 187-194, eight 174′ sub-chasers for U. S. Navy.

Hulls Nos. 195-198, four 145′ tugs for U. S. Navy.

DELTA SHIPBUILDING CORP.

New Orleans, Louisiana

New Construction:

Twenty-five EC-2 Emergency type vessels for U. S. Maritime Commission. 416′ x 56′10¾″ x 37′4″; 2500-hp triple expansion engine.

THE DRAVO CORPORATION

Engineering Works Division
Pittsburgh, Pa., and Wilmington, Del.

New Construction:

Hulls Nos. 1835-1840, six 165′ type PC submarine chasers for U. S. Navy, Washington, D. C. 2010 gross tons.

Hulls Nos. 1859-1861, three sand and gravel barges, for Keystone Sand Division. 135′ x 27′ x 8′; 765 gross tons.

Hulls Nos. 1868-1869, two 25-ton floating cranes, one each to Phil. and Norfolk U. S. Navy Yards, for U. S. Navy Dept., Washington, D. C.; 670 gross tons.

Hulls Nos. 1872-1875, four welded steel deck barges for Delaware, Lackawanna & Western R. R., 100′ x 30′ x 9′6″; 928 gross tons.

Hulls Nos. 1876-1877, two floating caisson gates for U. S. Navy, Philadelphia Navy Yard; 2330 gross tons.

Hulls Nos. 1898-1902, five welded hopper barges for Pittsburgh Coke & Iron Co., 175′ x 26′ x 11′; 2360 gross tons.

Hull No. 1903, floating caisson gate for U. S. Navy, Norfolk Navy Yard; 1330 gross tons.

Hulls Nos. 1904-1906, three welded sand and gravel barges for Cumberland River Sand Company; 130′ x 24′6″ x 6′6″; 579 gross tons.

Hulls Nos. 1907-1911, five 165′ type AM mine sweepers for Bureau Supplies & Accounts, U. S. Navy Dept., Washington, D. C.; 1675 gross tons.

Hulls Nos. 1912-1916, five 165′ type PC submarine chasers for Bureau of Supplies & Accounts, U. S. Navy Dept., Washington, D. C.; 1675 gross tons.

Hull No. 1927, fabricated steel hull for oil barge. 165′ x 35′ x 10′; 502 gross tons.

Hulls Nos. 1928-1933, six welded steel deck barges for Delaware, Lackawanna & Western R. R., New York City. 100′ x 30′ x 9′6″; 1392 gross tons.

Hulls Nos. 1934-1945, twelve welded steel oil barges for stock; 195′ x 35′ x 9′9″; 7176 gross tons.

Hulls Nos. 1946-1955, ten W-7 welded steel coal barges for stock; 175′ x 26′ x 11′; 4720 gross tons.

Hull No. 1956, 25-ton floating crane for Charleston, S. C. Navy Dept., Washington, D. C.; 335 gross tons.

Hulls Nos. 1957-1966, ten type W-7 welded bulk cargo barges for stock. 175′ x 26′ x 11′; 4720 gross tons.

Hulls Nos. 1967-1972, six welded oil barges for stock. 195′ x 35′ x 9′9″; 3588 gross tons.

Hulls Nos. 1973-1976, four welded sand and gravel barges for Keystone Sand Div. 135′ x 27′ x 8′; 1020 gross tons.

Hulls Nos. 1977-1986, ten type W-7 welded bulk cargo barges for stock. 175′ x 26′ x 11′; 4720 gross tons.

Hulls Nos. 1987-1992, six welded oil barges for stock. 195′ x 35′ x 9′9″; 3588 gross tons.

Hulls Nos. 1993-2009, seventeen covered lighters for Bureau of Supplies and Accounts, Navy Dept. 8840 gross tons.

Hulls Nos. 2010-2011, two welded side-dump scows for Bureau S. & A., Navy Dept., Washington, D. C. 115′ x 28′ x 7′6″; 240 gross tons.

Hulls Nos. 2012-2021, ten welded steel car floats, for Pennsylvania R. R., Philadelphia, Pa. 250′ x 34′ x 9′1″; 5940 gross tons.

Hulls Nos. 2022-2030, nine welded deck barges, for Erie R. R. 100′ x 30′ x 9′6″; 2088 gross tons.

Hull No. 2031, welded steel car float for Erie R. R. 250′ x 34′ x 9′1″; 594 gross tons.

★ **Hulls Nos. 2032-2041, ten type W-7 welded coal barges** for Weirton Steel Co. 175′ x 26′ x 11′; 4720 gross tons.

ELECTRIC BOAT COMPANY

Groton, Conn.

New Construction:

Two submarines, SS206, Grampus; SS208, Grayback; for U. S. Navy. Cost $2,937,000 each. Keels laid, Grampus, February 4, 1940; Grayback, April 3, 1940.

One submarine, SS204, Mackeral, for U.S. Navy. Keel laid October 6, 1939. Launched September 28, 1940.

Three submarines, SS212, Gato; SS213, Greenling; SS214, Grouper; for U. S. Navy. Cost $2,957,000. Keels laid, Gato, October 5, 1940; Greenling, November 12, 1940.

Thirteen submarines, SS215, Growler; SS216, Grunion; SS217, Guardfish; SS218, Albacore; SS219, Amberjack; SS220, Barb; SS221, Blackfish; SS222, Bluefish; SS223, Bonefish; SS224, Cod; SS225, Cero; SS226, Corvina; SS227, Darter. Cost $2,795,000 each.

Twenty-five submarines, SS240-SS264.

THE FEDERAL SHIPBUILDING AND DRY DOCK COMPANY

Kearny, N. J.

New Construction:

Hulls Nos. 168-169, CL51, Atlanta; and CL52, Juneau; two 6000-ton cruisers for U. S. Navy. Keels laid April 22 and May 27, 1940. **Launching date, Hull 168, September 6, 1941.**

Hulls Nos. 180-186, seven C-2 cargo ships for U. S. Maritime Commission. Keel laid, No. 180, April 17, 1941. Launching date, No. 180, September 27, 1941.

Hulls Nos. 191-193, three tankers for Sinclair Refining Co. 15,000 dwt. Keel laid. No. 191, April 17, 1941.

Hulls Nos. 194-197, four destroyers for U. S. Navy. Keels laid, Nos. 194-195, December 2, 1940; Nos. 196-197, December 16, 1940. **Launching dates,** No. 194 and 195, July 26; **No. 196 and 197, September 26, 1941.**

Hulls Nos. 198-203, six destroyers for U. S. Navy.

Hulls Nos. 204-205, two destroyers for U. S. Navy.

Hulls Nos. 206-213, eight destroyers for U. S. Navy. Keels laid, No. 206 and 207, February 11; No. 208 and No. 209, July 31, 1941.

Hulls Nos. 214-218, five destroyers for U. S. Navy.

Hulls Nos. 219-221, three cruisers for U. S. Navy.

Hulls Nos. 222-227, six destroyers for U. S. Navy.

Hull No. 228, one C-2 cargo ship for U. S. Maritime Commission. Keel laid, February 10, 1941. Launched July 11, 1941.

Hulls Nos. 229-230, two destroyers for U. S. Navy.

Hulls Nos. 231-232, two destroyers for U. S. Navy.

Hulls Nos. 233-240, eight cargo ships for the U. S. Maritime Commission.

Hulls Nos. 241-264, twenty-four C-2 cargo vessels for U. S. Maritime Commission.

GREAT LAKES ENGINEERING WORKS

River Rouge, Michigan

New Construction:

Hulls Nos. 287-289, three bulk freighters for Pittsburgh S. S. Co. 640′ x 67′ x 35′; 18,000 dwt; 4000-hp steam turbine engines.

HENRY C. GREBE & CO., IN

Chicago, Illinois

New Construction:

One 70′ twin-screw diesel cruiser yacht.

Two 135′ mine sweepers for U. S. Navy.

★ **Five 65′ steel harbor tugs.**

GREENPORT BASIN & CONSTRUCTION CO.

Greenport, L. I., N. Y.

New Construction:

Four coastal mine sweepers, AMC46-49, for U. S. Navy. **Delivered.**

Four coastal mine sweepers, AMC61-64, for U. S. Navy.

Twelve 135′ motor mine sweepers YMS 20-31, for U. S. Navy.

GULFPORT BOILER & WELDING WORKS, INC.

Port Arthur, Texas

New Construction:

Hull No. 176, diesel tug for General Motors Corp. 100′ x 24′ x 12′4″; 680 hp. **Delivery date, September 16, 1941.**

Hulls Nos. 186-187, two oil barges for Butcher-Arthur Corp., Houston, Texas. 165′ x 36′ 10′9″. **Delivery dates, No. 186, September 18; No. 187, October 5, 1941.**

Hull No. 189, diesel tug for General Motors Corp. 100′ x 24′ x 12′4″; 1000 hp. **Delivery date, October 15, 1941.**

Hulls Nos. 190-194, five diesel-electric tugs, for General Motors Corp., Cleveland Diesel Engine Division. 100′ x 24′ x 12′4″; 1000 shp.

GULF SHIPBUILDING CORP.

Chickasaw, Ala.

New Construction:

Four 2100-ton destroyers for U. S. Navy.

Four vessels for Waterman Steamship Corporation. 445′ x 63′ x 40′6″; shelter deck type; geared turbine drive; 15½ knots service speed.

Six 220′ mine sweepers, for U. S. Navy.

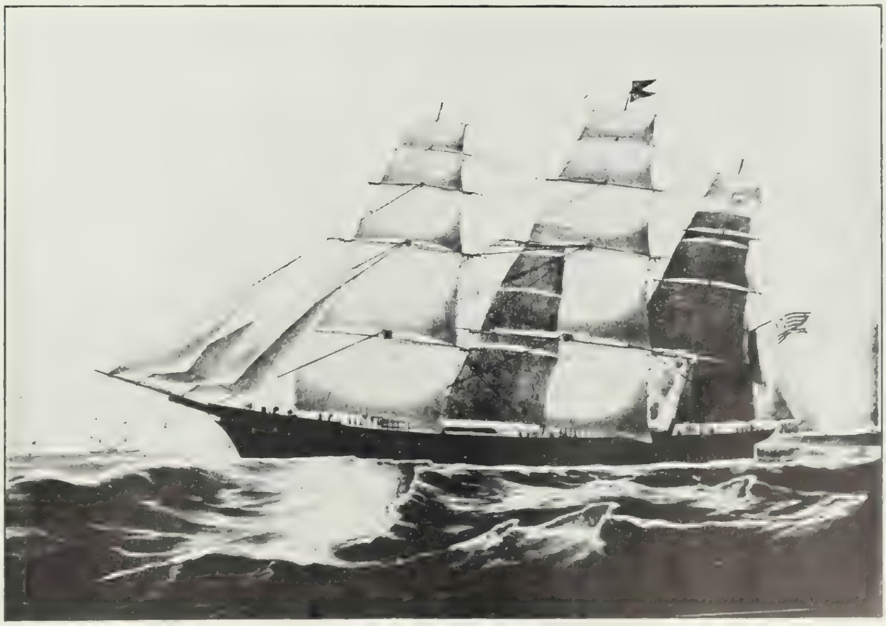
★ **Fourteen vessels** for U. S. Maritime Commission. 445′ x 63′ x 40′6″; shelter deck type; geared turbine drive; 15½ knots service speed.

HOUSTON SHIPBUILDING CORP.

Houston, Texas

New Construction:

Hulls Nos. 1-37, thirty-seven EC-2 cargo vessels for U. S. Maritime Commission. Estimated delivery dates, first, January 15, 1942; last, February 24, 1943.



THE INGALLS SHIPBUILDING CO.

Pascagoula, Miss., and Decatur, Ala.

Pascagoula

New Construction:

Hulls Nos. 268, 297-299, four C-3-IN passenger-cargo vessels for U. S. Lines. Completion dates, May, November, December, 1942; and February, 1943.

Hulls Nos. 265-267, three C-3-P passenger-cargo vessels for American-South African Line, Inc. Completion dates, November, December, 1941; and January, 1942.

Hulls Nos. 293-296, four C-3-S-A-2 cargo vessels for U. S. Maritime Commission. Completion dates, February, March, May and June, 1942.

Hulls Nos. 325-336, twelve C3-S-A2 cargo vessels for the U. S. Maritime Commission. 492′ x 69′6″ x 42′6″. Keel layings, from April 30 to December 31, 1943.

Decatur

New Construction:

Hulls Nos. 313-314, two sand and gravel barges, for stock. 110′ x 26′ x 6′6″. **Delivery date, September 15, 1941.**

Hulls Nos. 343-344, two 39,000-bbl oil barges for Eddie Erlbacher, Cape Girardeau, Mo. 195′ x 35′ x 9′9″. Delivery date, December 10, 1941.

Hulls Nos. AN 1-4, four net layers for U. S. Navy.

Four 9,000-bbl oil barges for Standard Oil Company, Cleveland, Ohio. 195′ x 35′ x 9′9″. Delivery date, December 1, 1941.

Hulls Nos. 345-348, four 1300-bbl. oil barges, for Illinois Oil Company, Rock Island, Ill. 230′ x 40′ x 9′6″.

GEORGE LAWLEY & SON CORP.

Neponset, Mass.

New Construction:

Twelve 45′ tank lighters for U. S. Navy.

Two 127′ fish trawlers for Booth Fisheries Co. Diesel powered.

Five boats for repair work for U. S. Navy.

Ten 165′ submarine chasers for U. S. Navy.

Conversion:

90′ launch Cutty Sark to U. S. Army launch Captain Dean C. Howard.

LEVINGSTON SHIPBUILDING CO.

Orange, Texas

New Construction:

Hull No. 185, ocean tug for U. S. Navy; 135′ x 30′ x 17′6″.

Hulls Nos. 194-195, two tugs for stock. 66′ x 17′ x 8′; 300-hp Atlas diesel.

Hull No. 201, barge for U. S. Navy. 173′ x 8′6″ x 39′.

Hulls No. 202, tug, for Pan American. 74′ x 20′ x 9′; 400-hp Atlas diesel.

Hull No. 203, coastwise tug for stock. 95′ x 24′ x 9′11″; 600-hp Atlas diesel.

Hulls Nos. 204-205; 207-210; six 8500-bbl oil barges for Pan American. 173′ x 8′6″ x 39′.

Hull No. 206, tug, for River Terminals. 74′ x 20′ x 9′; 400-hp Atlas diesel.

Hull No. 211, tug. 105′ x 25′ x 9′6″; 1000-hp General Motors diesel.

Hull No. 212, tug, for stock. 105′ x 25′ x 13′6″; 1000-hp General Motors diesel.

Hull No. 213, tug, for stock. 95′ x 23′ x 9′6″; 600-hp Superior diesel.

Hull No. 214, tug, for stock. 74′ x 20′ x 9′; 400-hp Atlas diesel.

★ **Hulls Nos. 217-220, four 143′ ocean tugs** for General Motors Sales Corp.

THE LUDERS MARINE CONSTRUCTION CO.

Stamford, Connecticut

New Construction:

Seven 65′ Naval tugs, YT160-YT169. Cooper-Bessemer diesel engines.

Two submarine chasers, PC505-PC506, for U. S. Navy.

Nine small subchasers for U. S. Navy.

Six 65′ all-welded steel, single-screw distribution box boats for Quartermaster Corps, U. S. Army. Diesel propelled.

Three 165′ steel subchasers for U. S. Navy. Keel laid, first vessel, July, 1941.

Four wooden subchasers for U. S. Navy.

MANITOWOC SHIPBUILDING CORP.

Manitowoc, Wisconsin

New Construction:

Ten submarines, SS265-274, for U. S. Navy.

MARIETTA MANUFACTURING CO.

Point Pleasant, W. Va.

New Construction:

Four net tenders, YN13-16, for the U. S. Defense Commission. Total cost $2,040,000. Launching dates, March 20, April 17, June 19, July 2, 1941. **Delivery dates, first, September, 1941;** remainder, before January, 1942.

Hulls Nos. 474-489, sixteen all-steam propelled mine planters, for the U. S. Army. Cost about $12,000,000. Keel laying dates, No. 474, May 14; No. 475, May 20; No. 476, June 24; No. 477, July 11, 1941.

MARINE IRON & SHIPBUILDING CO.

Duluth, Minnesota

New Construction:

Hulls Nos. 70-72, three 180′ cutters of "Cactus" type for U. S. Coast Guard.

JOHN H. MATHIS CO.

Camden, N. J.

New Construction:

Four anti-submarine net tenders for U. S. Navy.

One bulk carrier tanker 265′ long for Thos. Bowes, N. A.

Three 220′ mine sweepers for U. S. Navy.

MIAMI SHIPBUILDING CORP.

Miami, Florida

New Construction:

Seven high-speed, off-shore patrol boats.

NEWPORT NEWS SHIPBUILDING & DRYDOCK CO.

Newport News, Va.

New Construction:

Hull No. 378, battleship 58, Indiana, for U. S. Navy. Keel laid November 20, 1939.

Hull No. 384, one single-screw combination passenger and cargo vessel for U. S. Maritime Commission. 465′ x 69′6″ x 42′6″; gross tonnage about 9100 tons. **Delivery date, September 11, 1941.**

Hull No. 385, aircraft carrier No. 8, Hornet, for U. S. Navy. Launched December 14, 1940.

Hull No. 386, single-screw combination passenger and cargo vessel for U. S. Maritime Commission. 465′ x 69′6″ x 42′6″; gross tonnage about 9100 tons. Delivery date, November, 1941.

Hulls Nos. 390-391 (CL62-CL63), two light cruisers for U. S. Navy.

Hulls Nos. 392-394 (CV9-CV11), three aircraft carriers for U. S. Navy.

Hulls Nos. 395-398 (CV12-CV15), four aircraft carriers for U. S. Navy.

Hulls Nos. 399-400 (CL80-CL81), two light cruisers for U. S. Navy.

THE NEW YORK SHIPBUILDING CORPORATION

Camden, N. J.

New Construction:

BB57, South Dakota, battleship for U. S. Navy. Keel laid July 5, 1939.

AR5, Vulcan, repair ship for U. S. Navy. Keel laid December 26, 1939.

CL55, Cleveland; and CL56, Columbia; two cruisers for U. S. Navy. Order placed March 23, 1940.

CL57 and CL58, two cruisers for U. S. Navy. Order placed June 12, 1940.

AV7, Currituck, seaplane tender for U. S. Navy.

CL59-CL61, three cruisers for U. S. Navy.

CB1-CB6, six cruisers for U. S. Navy.

CL76, four cruisers for U. S. Navy.

NORTH CAROLINA SHIPBUILDING CO.

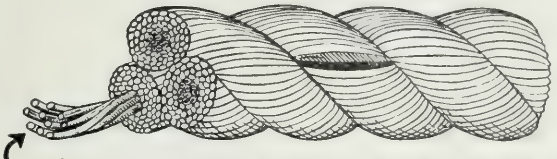
Wilmington, N. C.

New Construction:

Hulls Nos. 1-37, thirty-seven all-welded steel EC-2 cargo vessels for U. S. Maritime Commission. **Keel laying dates,** No. 1, May 22; No. 2, May 22; No. 3, May 28; No. 4, August 22; **No. 5, September 3; No. 6, September 4; No. 7, October 12; No. 8, October 21, 1941.**

SEE THIS NEW FITLER
SELF-LUBRICATING ROPE

LUBRICORE



CONTROLLED SELF-LUBRICATING GREEN YARN CENTER

ON DISPLAY . . . BOOTH No. 2
PROPELLER CLUB CONVENTION
SAN FRANCISCO, CALIFORNIA

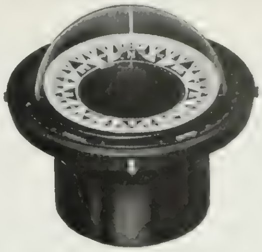
THE EDWIN H. FITLER CO.

WEST COAST AGENTS:

Fletcher-Weil Co.
Los Angeles, Calif.
San Francisco, Calif.

•

Coleman & Co.
Portland, Oregon



The

KELVIN-WHITE
SPHERICAL COMPASS

has been installed on many new passenger and freight ships for the Maritime Commission and private owners.

* * *

We manufacture all kinds of compasses and binnacles, and are contractors for any and all kinds of Navigational Equipment.

●

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Represented on the Pacific Coast by

Capt. Frank Jansen, 1361 South Flower Street, Los Angeles
George E. Butler Co., 356 California Street, San Francisco
Nuttall-Styris Co., 825 Columbia St., San Diego, Calif.
Max Kuner Company, 812 First Avenue, Seattle
Pacific Marine Supply Company, Seattle

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BENDIX AVIATION CORPORATION
MARINE DIVISION

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signal equipment

Mechanical and Electric Telegraphs • Annunciators • Rotating Clear Vision Devices • Fire Detecting Systems • Sound Powered Marine Telephones • Lighting Fixtures • Switches • Receptacles • Salinity Indicating Systems • Running Light Panels • Bells • Rudder Angle Indicating Systems • Shaft Revolution Indicating Equipment • Whistle Control Systems • Voice Tube Communicating Equipment

BENDIX AVIATION CORPORATION
MARINE DIVISION
754 Lexington Avenue **Brooklyn, New York**

THE PUSEY & JONES CORP.
Wilmington, Del.

New Construction:

Hull No. 1076, C-1A cargo ship. Launched August, 1941. Delivery date, November, 1941.

Hulls Nos. 1082, Hains; and 1083, Hoffman; two seagoing hopper dredges for War Dept., U. S. Engineers Office, Philadelphia, Pa. 215'10½" x 40' x 15'6"; approx. 2000 gross tonnage; diesel-electric propulsion, 950 shp. Delivery dates, February and August, 1942.

Hulls Nos. 1084-1093, ten C-1A type cargo ships for U. S. Maritime Commission. 412'3" x 60' x 37'6"; 9000 dwt; 4000-hp steam turbine propulsion.

R. T. C. SHIPBUILDING CORP.
Camden, N J.

New Construction:

Hull No. 136, 1700-ton motor tanker, T. W. Drennan. 260' x 42' x 18' Launching date, July 19, 1941.

Hull No. 137, 995-ton motor tanker. 190' x 36' x 12'.

Hulls Nos. 138-139, two 985-ton motor tankers. 190' x 36' x 12'.

SOUTH PORTLAND SHIPBUILDING CORP.
Portland, Maine

New Construction:

Hulls Nos. 201-216, sixteen EC-2 type cargo vessels, for U. S. Maritime Commission.

SUN SHIPBUILDING AND DRY DOCK COMPANY
Chester, Pa.

New Construction:

Hulls Nos. 199-206, eight C-2 cargo vessels for U. S. Maritime Commission. 474' x 63' x 40'6"; 7400 gross tons; diesel propelled; 7500 shp; 16 knots. **Launching dates,** No 199, May 24; No. 200, June 21; No. 201, July 26; No. 202, August 23; **No. 203, September 20; No. 204, October 18;** No. 205, December 6, 1941; No. 206, January 14, 1942. **Delivery dates, No. 199, September 25; No. 200, October 15; No. 201, October 30;** No. 202, December 1; No. 203, December 15; No. 204, December 31, 1941; No. 205, February 10; No. 206, March 15, 1942.

Hulls Nos. 213-216; 219-220, six tankers for Panama Transport Co. 547'3" x 70' x 40'; 11,400 gross tons; 7500 shp; 15 knots speed. Launching and delivery dates, 1942-1943.

Hulls Nos. 217-218, two tankers for Standard Oil Co. of N. J. 547'3" x 70 x 40'; 11,400 gross tons; 7500 shp; 15 knots speed **Launching dates,** No. 217, August 2; **No. 218, September, 1941. Delivery dates, No. 217, October; No. 218, November, 1941.**

Hulls Nos. 221-222, two tankers for Keystone Tankship Corp. 520' x 68' x 37'; 10,600 gross tons; turbine; 12,000 shp; 16½ knots. **Keel laying dates,** No. 221, June 12; **No. 222, September 11, 1941. Launching dates, No. 221, October 4, 1941.** No. 222, January 10, 1942. Delivery dates, No. 221, December, 1941; No. 222, March, 1942.

Hulls Nos. 223-225, three tankers for The Texas Co. 513'10" x 68' x 36'; 9300 gross tons; turbine; 9000 shp; 16 knots. Launching and delivery dates, 1942.

Hull No. 226, tanker for Kaymar Tankship Corp. 520' x 68' x 37'; 10,600 gross tons; turbine; 12,000 shp; 16½ knots. Keel laying date, December, 1941.

Hulls Nos. 227-228, two tankers for Seamar Tankship Corp. 520' x 68' x 37'; 10,600 gross tons; turbine; 12,000 shp; 16½ knots. Keel laying dates, 1942.

Hull No. 230, tanker for Atlantic Refining Co. 474' x 65' x 37'; 8000 gross tons; turbo-electric; 5000 shp; 14½ knots. **Launching date, September 19, 1941.** Delivery date, 1942.

Hulls Nos. 231-232, two tankers for Keystone Tankship Corp. 520' x 68' x 37'; 10,600 gross tons; turbine; 12,000 shp; 16½ knots. Delivery date, 1942.

Hulls Nos. 233 and 240, two tankers for Gulf Oil Corp. 485' x 68' x 36'; turbine propelled; 14½ knots. Delivery dates, August, 1942, and December, 1942.

Hull No. 234, tanker for Sun Oil Co. 547'3" x 70' x 40'; 11,400 gross tons; diesel propelled; 7500 shp; 15 knots. Delivery date, 1942.

Hulls Nos. 235 and 237, two tankers for Standard Oil Co. of N. J. 547'3" x 70' x 40'; 11,400 gross tons; turbine; 7500 shp; 15 knots. Delivery date, 1942.

Hull No. 236, tanker for Atlantic Refining Co. 543'10" x 70' x 40'; 11,600 gross tons; turbo-electric; 5000 shp; 13 knots. Delivery date, 1942.

Hulls Nos. 238-239, two tankers for Standard Oil Co. of Calif. 521' x 70' x 40'; turbine propelled; 15½ knots. Delivery dates, November and December, 1942.

Hulls Nos. 241-312, seventy-two tankers.

TAMPA SHIPBUILDING CO.
Tampa, Fla.

New Construction:

Hulls Nos. 37-40, four C-2 type cargo vessels for U. S. Navy. 459' x 63' x 31'6"; 9291 dwt tons.

TODD-BATH SHIPBUILDING CORP.
Bath, Maine

New Construction:

Hulls Nos. 1-30, thirty cargo vessels for British Purchasing Commission. Cost $50,000,000. Keel laying dates, No. 1, May 24; No. 2, June 4; No. 3, June 18; No. 4, June 18; No. 5, August 2; No. 6, July 16; No. 7, July 25, 1941.

F. B. WALKER & SONS
Pascagoula, Mississippi

New Construction:

One all-welded steel tug for Florida interests. 68' x 17' x 8'6"; 300-hp Atlas diesel.

One all-welded steel tug for Colle Towing Co. 75' x 19' x 9'; 400-hp Atlas diesel.

One all-welded steel barge, 132'x32'x8'6".

Two all-welded steel oil barges, 180'x36' x 9'.

Two steel tugs, 75' x 19' x 8'6".

WHEELER SHIPYARDS, INC.
Brooklyn, N. Y.

New Construction:

Ten bomb target boats for U. S. Navy.

Forty 83' cutters for U. S. Coast Guard. Cost $42,500 each.

Twelve large wooden mine sweepers for U. S. Navy.

Keep Posted!

Recent Development in Ship, Yard and Dock Equipment

New Transformer Arc Welders

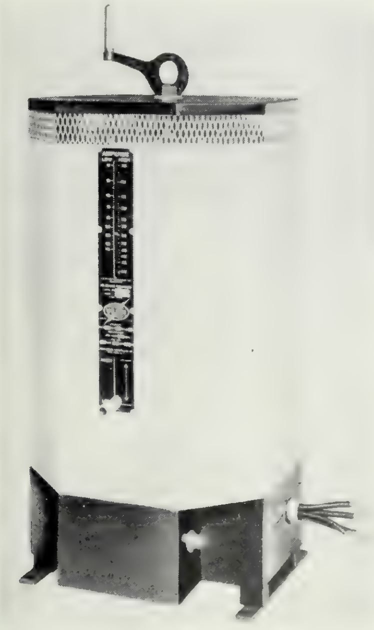
A new line of ac Transformer Welders in 300, 500, 750 and 1000 ampere capacities has just been announced by Wilson Welder and Metals Company, Inc.

Known as Model TW, these welders are completely self-contained units that will meet the heavy arc welding needs of shipyards, railroads and steel mills; for 220, 440 or 550 volts, 25 or 60 cycle current. When arranged for 220 and 440 volt operation, single phase, either voltage can be brought into use by a reconnection of the leads which are brought outside the unit.

The new welders have a wide range of current output and continuous stepless current regulation is provided over the entire range by means of a hand crank on top of the machine. This crank makes it possible to rapidly shift the setting as changes are made from one class of work to another.

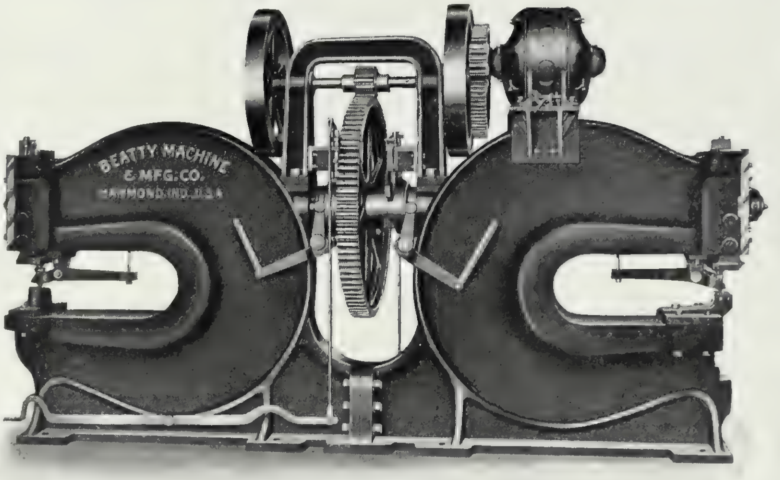
The Model TW conforms to N. E. M. A. requirements, and it is said to operate cooler and therefore last longer, because of divided construction of the coils which allows greater surface area to be exposed to the cooling air. All coil covering is spun glass fiber, heat-resistant, Class BB insulation, providing trouble-free operation even if used continuously at maximum settings.

(Page 166, please)



Model TW transformer welder

BEATTY Modernized
POWER PUNCHES and SHEARS



The No. 6 Double End Punch. Beatty punching machines have various size throat depths in both single and double ends.

for the Immediate Need of
Coast Shipyards

Beatty Products are now being made available for Pacific Coast yards.

To meet your urgent requirements, we offer a complete line of punching and shearing equipment with superior construction advantages which will satisfy the most exacting buyer who requires machines that will stand up for years with minimum attention.

BEATTY EQUIPMENT eliminates unnecessary handling through combination set ups, and large die space, thereby increasing production and reducing costs.

Let
Beatty
Solve
Your
Problems

Punching & Shearing Machinery

Copers
Presses
Dies

Beatty

Bulldozers
Portable
Cranes

BEATTY MACHINE & MFG. CO.
HAMMOND, INDIANA

A COMPLETE MARINE RUBBER SERVICE

The Hercules Equipment and Rubber Co., formerly located at 11 Mission Street, San Francisco, since its organization in 1919, and which six years ago moved to much larger quarters at 550 Third Street, has served and is serving the marine trade in many ways.

This firm has always kept pace with the times and, among other things, is having made up and carrying in stock specialty hoses of different and appropriate colors instead of staying with the original black color hose.

They also stock complete lines of packings, belting, hose and hose couplings, V belts and sheaves, fire extinguishers, marine circulating pumps, and everything in the mechanical rubber line that goes to serve the marine trade.

The Hercules Equipment and Rubber Co. sometime since purchased the original Gasket Shop and the Standard Rubber Co. and are now operating both plants in modern quarters at 435 Brannan Street.

A portion of this complete service is the manufacture of metal gaskets and gaskets of every other description, including: port strip, rubber valves, special molded rubber goods, navy float stock and navy sheet, both high pressure and cloth inserted types. These two factories have rounded out a most complete service to the marine trade, which the Hercules Equipment and Rubber Co. is proud to have maintained for twenty-two years.

* * *

A Steam Gun For Oakite

Because speed is such an essential factor today in shipbuilding, a new improved type of steam gun recently developed by Oakite Products, Inc., New York, designed to facilitate and speed up the many cleaning operations required in building naval vessels, oil tankers and merchant ships, is of timely interest.

Known as the Oakite Solution-Lifting Steam Gun, this unique development provides the triple combination of heat, mechanical force and effective detergent action to speedily and thoroughly remove grease, oil, chips and dirt from large machined parts between operations, or before inspection and assembly. Motors, machinery and other large equipment can also be effectively and quickly cleaned with this unit.

Because of its exclusive solution-lifting feature, this new gun is said to automatically lift the cleaning solution from floor level to a working height of 12 feet without the aid of pumps, injectors, or other accessories previously required in steam cleaning. All that is needed to operate the gun is a steam supply of 30 or more lbs. pressure, steam and solution hoses and an open-top container for the cleaning solution.

Another fact of interest, particularly to those private shipyards and Navy Yards engaged in reconditioning vessels, is that the gun is also reported to be highly suitable for such jobs as cleaning dismantled marine motors and machinery before repair and overhaul; steam cleaning holds, bilges, etc.; and preparing superstructures and other large surfaces for repainting.

An illustrated 8-page booklet giving complete specifications, prices and operating data is available upon request.

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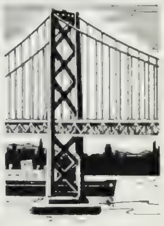
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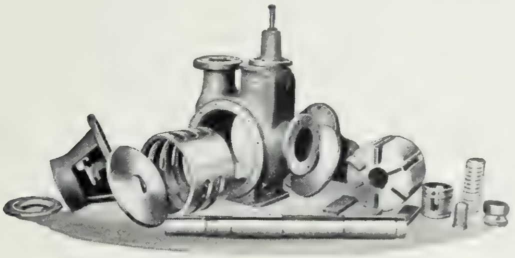

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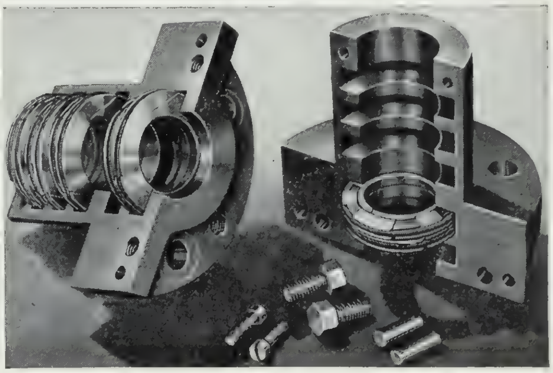

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New York City—France Packing Co., Room 107-E, 30 Church St. —COrtlandt 7-6827.
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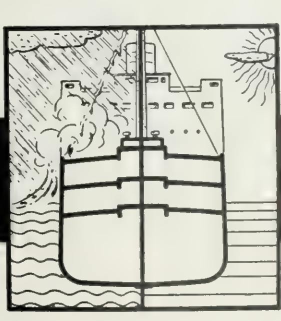

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NEW GASKET FOR RIVETED SEAMS

A new neoprene impregnated tape which speeds up the gasketing of riveted seams in marine construction has recently been developed by the "Fabrikoid" Division of E. I. du Pont de Nemours & Company.

This tape is ideal for marine superstructures where watertight seams between similar or dissimilar metals are essential. Its use speeds the sealing of sheet metal joints and seams, because it is easy to apply and requires little clean-up operation. To eliminate all waste, the tape is supplied in rolls of various widths.

P. A. W. Sealing Tape, as the new material is called, is of cotton fabric, faced on both sides with a neoprene corrosion-resisting compound. On each surface a layer of dry cement is added. In applying the tape to a metal surface, the dry cement on one side is moistened with kerosene, benzine, or other light oil, and the tape is then pressed into place. To complete the joint, the outer surface of the tape is moistened and a piece of metal pressed into place. Clamping, drilling and riveting can then proceed. If the joint is not completed with a permanent fastener within 24 to 48 hours, the cement can be resoftened by applying kerosene.

This tape will drill cleanly. Like other neoprene products, it resists sea or fresh water, gasoline, oil and common cleaners.

Wider applications in shipbuilding are anticipated, since the tape provides a rapid and economical method for sealing metal joints and seams. It is available in 17/1000 and 50/1000 thicknesses.

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* * *

I-Gards For Eye Protection

I-Gards are a new product just introduced by B. F. McDonald Co., well-known Western manufacturer and distributor of safety appliances. Growing out of the need for a device for industrial eye protection which would allow the wearer an unrestricted wide angle of vision and at the same time afford complete protection, I-Gards are a revolutionary development in the plastics field. Light, comfortable, exceptionally strong, inexpensive, these new eye protectors are produced without individual grinding of lenses—an important factor, since the optical industry is already badly overburdened by defense requirements.

I-Gards are injection-molded of clear plastic under rigid controls which assure optical accuracy and maximum strength. In addition to clear lenses, they are also provided in a green Vernalite tint, a color which satisfactorily filters out glare and harmful light rays. The unique design employed eliminates pressure on the bridge of the nose and on the ears, and adequate ventilation further improves the non-fogging characteristic of the material used in I-Gards. A bulletin on this product may be obtained by writing B. F. McDonald Co., 1174 Howard Street, San Francisco, Calif.

No better brushes—at any price! Emerald Brushes are as necessary to a good paint job as Fuller Paints. In patented fibre containers that keep them in perfect condition, before and after using—prolong their life—save you money. Distributed by Fuller Paint Dealers.

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The men here at Viking are a pretty peace-loving lot. They work hard, like to picnic, to boat and fish on the river, to go for long drives with their families. But let a national emergency pop-up, like the one we've got now, and they can get tough in a hurry.

We've watched our men bend a little closer to their lathes, we've seen them sacrifice leisure time for overtime, we've caught the seriousness of their attack upon a casting, an assembly job, a shipping crate. They know that in their efforts is America's answer.

In comparison with the big, sprawling airplane factories and booming steel mills, our job seems sorta small and insignificant. But to all of us here at Viking it's the most important thing we've ever done.

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Bridgeport, Conn.

NOTABLE EXHIBIT
OF MARINE PAINTINGS

During September and October, the Art Gallery at "Gumps," San Francisco, was filled with beautiful marine paintings by Frank Vining Smith. This spirited sample, entitled "A Fair Wind," shows a fine clipper running before the trades on a beautiful sea. These old beauties now live only in the memories of a few old-timers, but they still have a very potent lure for the rocking-chair salts.

Transformer Arc Welders

(Continued from page 161)

On 60 cycle units, all sizes are fan cooled except the 300 ampere size, which is cooled by natural draft. On 25 cycle units, all sizes are fan cooled. The 60 cycle units have high- and low-range switches, while the 25 cycle units have only one range. This low-range switch provides current adjustments on the 500 ampere size from 40 to 650 amperes. Power factor correction is included in all models for 60-cycle operation except the 300 ampere size. Welders built for 25-cycle operation do not have power factor corrected. Efficiency of all the TW units is approximately 80 to 85%.

◆

New Circuit Interrupter

For disconnecting or interrupting ac and dc circuits in class 1 group D locations where atmospheres contain gasoline alcohols, natural gas and other explosive vapors, a new non-automatic circuit interrupter is announced by Westinghouse Electric and Manufacturing Company.

Manually operated, the De-ion circuit interrupter is furnished with a NEMA type 7 cast enclosure finished in aluminum with a closely ground fit between the box and cover. Resistance to explosive pressures of hazardous atmospheres is assured by the heavy walls and strong fastenings.

Designed for 250 to 600 volts on ac circuits and 125 to 250 volts on dc circuits, the units are rated from 50 to 600 amperes depending on the frame sizes. Interrupting capacity is 5000 to 10,000 amperes.

Contact burning is reduced to a minimum by De-ion arc quenchers which divide and extinguish arcs almost instantly. Silver or special silver composition with non-welding characteristics is used for all main contacts.

◆

New Triplex Power Pump

A new high pressure vertical triplex power pump is supplied by Worthington in eight sizes, for pressures up to 9800 pounds and capacities up to 51 gpm. This pump is of the vertical triplex single-acting plunger type and particularly suited to applications where small capacities and high pressures are required, as for the operation of hydraulic presses, manufacture of plastics, for roll balancing in steel mills and, to an appreciable extent, in oil refineries on special process work.

This pump has no gears and is especially designed for use with built-in gear head motors, although it can be arranged for V-belt drive.

This pumping unit is very compact and has high efficiency. One of the important features of its construction is that its plungers are outboard and there is a dry joint between the liquid cylinder and power frame, thus eliminating the possibility of leakage of the liquid being pumped into the crankcase, effectively preventing contamination of lubricating oil.

◆

Mormacsun Delivered: Expansion of shipbuilding activities in the United States has stimulated the development of improved methods of construction whereby ships can be built more rapidly and at the expense of fewer man hours. During the first World War, the Moore Shipbuilding Co., on San Francisco Bay, had a record of launching six ships on one tide in fifty-five minutes, a total of 58,000 deadweight tons. During the present emergency, by using special welding methods, they have made remarkable construction records. A recent ship to be completed, the Mormacsun, is the last of an order for four C-3 cargo vessels. It is described in a handsomely illustrated leaflet distributed by the De Laval Steam Turbine Co., Trenton, N. J., suppliers of the geared propulsion units and turbo-generator sets used in these ships.

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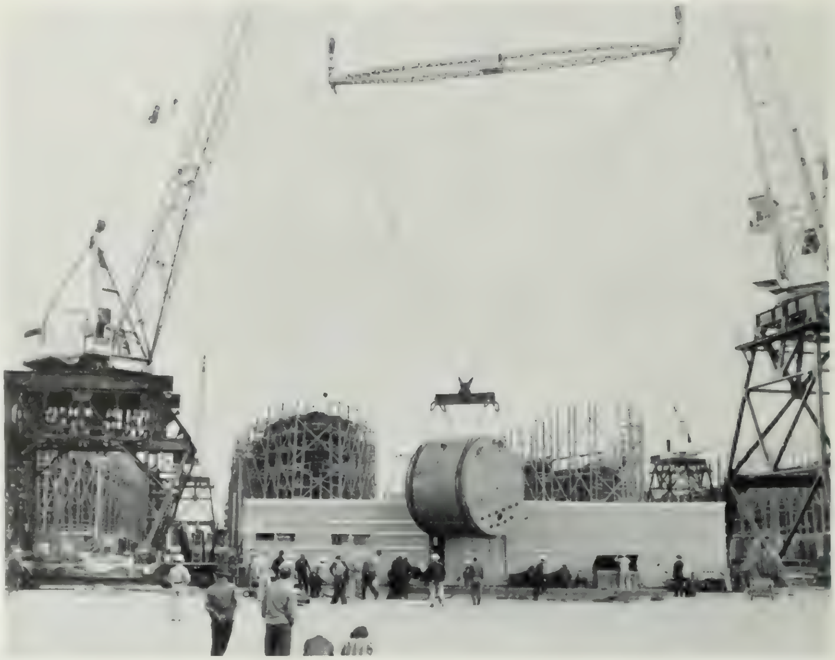

Boiler-carrier sling made in shop of Chas. A. Young Co., for San Francisco Bay shipyard

The accompanying illustration of a boiler-hoisting sling installed at one of the local shipyards shows the interesting type of work being done for shipyards and steamship companies by the Charles A. Young Company of San Francisco.

This firm was organized in 1939 by Captains S. A. Young and George E. Dow, formerly with the Grace Line and Swayne & Hoyt, to engage in the sale of wire rope, Manila rope, chain, blocks, hooks, shackles and all allied rope fittings.

Both Captains Young and Dow have had years of experience in the application of the products they sell in the marine field. These products include the Jones & Laughlin Steel Corporation's Permaset wire rope; Whitlock and Kating Manila Rope, and high-grade alloy steel shackles, blocks and hooks, manufactured by the Mallory Logging Equipment Company.

The firm, orginally located at 272 Fremont Street, leased the present location at 840 Harrison Street, early this year. The new building is 50 x 180 feet, providing ample warehouse space and facilities for manufacturing long stays and slings in the rigging department.

The rigging department is in charge of H. K. Beck, formerly rigger at large shipyards in Copenhagen, Hamburg and San Francisco.

Mr. Beck has a Danish skipper's license and obtained his experience on square-rigged ships. He sailed for a number of years in the old flying "P" line out of Hamburg on the Priwarland Parmir and also sailed in the Birkdale, last three-masted bark out of Liverpool. He has been in the San Francisco Bay region for the past six years.

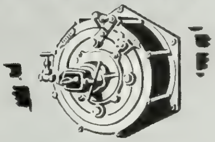
The new home of the Wheelco Instruments Co., Chicago, Ill., gives to that firm the expanded space and equipment much needed for their growing business.

Rubber Goods for The Marine Industry

The Quaker City Rubber Company Marine Division manufactures a full line of marine rubber and rubber fabric specialties including: cotton rubber-lined fire hose; washdeck hose; steam hose; water hose; cargo loading and discharge hose; ebonite and pure gum sheet packing; rod, shaft, and valve stem packing; ebonite piston head rings; pump valves, asbestos boiler gaskets; and dredging sleeves.

Their ebonite pump piston rings have long been recognized as an excellent seal for use on boiler feed, oil transfer, bilge and ballast pumps aboard ship.

TODD COMBUSTION EQUIPMENT



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LA PORTE INDIANA

Rally at Los Angeles

(Continued from Page 88)

Edgar M. Wilson, first vice-president and Southern California manager of the American President Lines.

The members and their affiliation follow:

William D. Aitken, president, Mission Dry Corp.; Jean M. Allen, principal inspector, U. S. Maritime Commission; E. J. Baird, district safety engineer, Accident Prevention Bureau; Robert H. Braun, Robert H. Braun Co.; John C. Byrne, chief engineer, California Shipbuilding Corp.; Jos. M. Costello, president, J. M. Costello Supply Co.; Jerome K. Doolan, assistant general manager, California Shipbuilding Corp.; R. C. Groesbeck, local manager, John A. Roebling's Sons Co. of Calif.; Basil T. Kehoe, production manager, California Shipbuilding Corp.; Edwin Kellenberger, Wilmington Transportation Co.; John A. McCone, vice-president and general manager, California Shipbuilding Corp.; Hugh Middleton, local manager, De La Rama Steamship Co.; Mario Palmieri, Naval architect and engineer, Consolidated Steel Corp., Ltd.; William I. Selover, district manager, Sperry Gyroscope Co., Inc.; W. E. Wallenberg, marine superintendent, Wilmington Transportation Co.; William E. Waste, administrative manager, California Shipbuilding Corp.; and Calvin D. Wood, Southern California manager for *The Log*.

The meeting, celebrating "Liberty Fleet Day," brought out many members of the shipbuilding industry. Speakers included John A. McCone, California Shipbuilding Corp., who told of the growth of his company from zero last March to a personnel of more than 7000 to date culminating in the launching of their first ship the John C. Fremont, Saturday, September 27. Other speakers were Robert Gerhart, manager of the shipbuilding division of the Consolidated Steel Corporation, which launched its fourth ship, the Alcoa Polaris, at Long Beach on "Liberty Fleet Day," and Milos Rados, vice-president of the Harbor Boat Works which also launched two Navy vessels the same day.

Highlight of the noon meeting was a talk by George F. Prussing, safety engineer for the oil industry, who made a slashing attack upon safety conditions in American harbors. He characterized the safety methods placed in effect around oil terminals as the best in the country but that harbor piers, approaches to cargo terminals and lumber piers were open to easy sabotage. He declared the port's fire alarm system was "antique" and inadequate but that steps were being taken to correct this condition.

Special guests included Captain Richard B. Coffman, U. S. N., assistant commandant, Eleventh Naval District, and Captain L. L. Bennett, commander, U. S. Coast Guard. The meeting was programmed by Howard Wickersham, member of the Board of Governors and vice-chairman of the House Committee. Wickersham reported progress on Convention Plans and indicated that Los Angeles would be represented at the Propeller Club annual convention in San Francisco, October 21 to 24, inclusive, with approximately sixty members and guests.

Beetle Fight A Navigation Light

A green fluorescent light installed to protect his roses from night-working Japanese beetles has literally placed "on the map" the garden of W. A. Ramsay, General Electric representative in Honolulu, Hawaii.

Navy authorities noticed that the light, at an elevation of 1369 feet on the side of Mount Tantalus, just back of Honolulu, was visible for more than 46 miles at sea and, after ascertaining its purpose, had the U. S. Coast and Geodetic Survey make measurements and list it as an official light, much to Mr. Ramsay's surprise.

Charts place it at latitude 21 degrees 19 minutes and 41 seconds north, and longitude 157 degrees 49 minutes and 13 seconds west. A letter mailed by E. A. Crellin, one of his friends, in San Francisco, and addressed only as "Keeper of Navigation Light" at this spot was delivered promptly to Mr. Ramsay.

"The idea of burning lights at night to retard or repel Japanese beetles which work only at night is an old one in Honolulu," explains Mr. Ramsay. "The light is made up of four 20-watt green fluorescent tubes. Green was selected because its color gives the highest efficiency in fluorescent tubes. The light is operated by a time switch; and I pay no further attention to it."

* * *

"Selflube" Porous Bearings, a revised catalog, listing additions to their line, has just been issued by the Keystone Carbon Co.

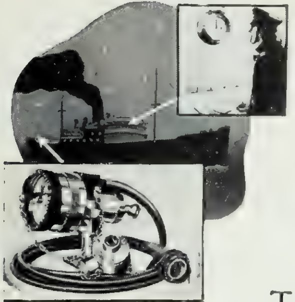
The new catalog describes the properties and uses of these self-lubricating bearings and furnishes complete details on the correct method of installation. Many different shapes of "Selflube" Porous Bearings are illustrated. Standard sizes for plain bearings, flanged bearings, and thrust bearings, are listed.

* * *

Charles H. Roberts, treasurer of Johns-Manville Corporation, died Wednesday morning, September 10, at Doctors Hospital where he had been confined since August 20 for treatment of a heart ailment. Mr. Roberts was 51 years old and lived in Scarsdale, N. Y.

Born on a farm near Doylestown in Bucks County, Pennsylvania, on May 8, 1890, Mr. Roberts received his secondary education in Trenton, N. J., and attended the Wharton School of Finance of the University of Pennsylvania until 1907, when he began his business career with J. A. Roeblings Sons Co., as head of their cost department.

Later he served in various capacities in the financial departments of the Mercer Automobile Co., Hess-Bright Manufacturing Co., U. S. Rubber Co., Splitdorf Electrical Co., and Julius Kayser & Co. before joining Johns-Manville in 1928 as assistant general auditor.



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When Clear—Burn blue light or give four flashes on Morse lamp.
Daylight—Set Jack at foremast.

SIGNALS DISPLAYED BY PILOT BOATS

When on Station Under Sail—A white light is carried at masthead.
When Under Power—A red light under white; a flare or torch is also burned frequently.

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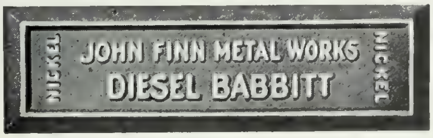
John Finn Metal Works



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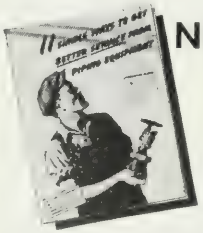
11 SIMPLE WAYS TO GET BETTER SERVICE FROM PIPING EQUIPMENT

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The Catalogs of Today Become the Technical Handbooks of Tomorrow

Pursers Manual and Marine Storekeeping, by Charles E. Hill. 200 pages, 7½″ x 5″, with many diagrams and forms, bound in blue buckram with black stampings, published by the Cornell Maritime Press, price $2 net.

The present revival of shipbuilding and of training for sea life is bringing out some very much-needed and some very excellent manuals covering various phases of the work on shipboard. The volume under review is dedicated "for the creation of a trained reserve of assistant pursers of the cracker-jack variety, neat in appearance, military in deportment, and skilled in the execution of their duties, who shall be a credit both to the company for which he works and to the flag under which he serves."

Every duty of purser and/or storekeeper on board ship is covered in detail and with sample reports, manifests, lists, and inventories reproduced for study.

◆

Individualized Inco Nickel Alloys—a twelve-page catalog giving individual characteristics, mechanical properties and application information on the Inco nickel alloys—Monel, "K" Monel, "KR" Monel, "S" Monel, "R" Monel, Nickel, "Z" nickel and Inconel. Tables of physical constants and available forms are included. Copies are available upon request.

◆

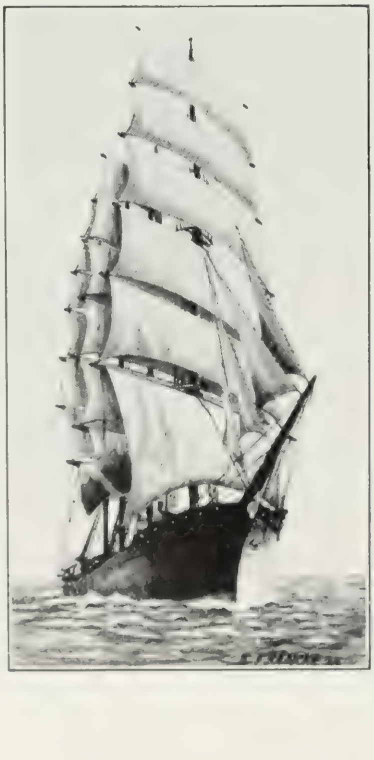
Universal Blowers: a new 64-page combined catalog and engineering data book just published by the Ilg Electric Ventilating Co. of Chicago, Illinois.

Colorfully printed and profusely illustrated, this book features Ilg's four lines of direct-connected and belted blowers, plus the two lines of volume blowers; the construction of the Ilg-built motor; advantages of the Ilg patented Variable Air Controller and Floated Drive; and the complete group of marine blowers. Uses of each type, characteristic curves, dimensions and performance data are included. Then, as an extra service, fan performance laws, an altitude table, air friction and duct graphs, sample specifications and a chart of universal discharge arrangements have been reproduced.

While distribution of the manual is being restricted, qualified architects, engineers and contractors may receive a copy by calling the nearest Ilg branch or writing direct to the Ilg home office in Chicago.

◆

Oil Circuit Breakers. Allis-Chalmers Mfg. Co., Milwaukee, Wisconsin, has just issued a four-page bulletin (B-6179) on Type DZ-40A oil circuit breakers. These are rated 2000 amperes or less, 15,000 volts, 100,000 kva interrupted capacity. They are equipped with "Quick-Quench" Ruptors and arranged for either manual or electrical operation.



◆

Motors. Allis-Chalmers Mfg. Co., Milwaukee, Wisconsin, has just issued an eight-page bulletin (B6052-B) which concisely describes the complete line of the company's Lo-Maintenance Motors in ratings from ¾ to 75 hp open, enclosed and splash-proof types, ac and dc.

◆

Centrifugal Pumps. Allis-Chalmers Mfg. Co., Milwaukee, Wisconsin, has just issued an eight-page book (B-6059) which concisely describes and illustrates the wide range of pumps built by this company. Included in the book are pumps for handling capacities from 10 to 200,000 gpm, and for heads ranging from 10 to 4200 feet. Also single and double suction single-stage pumps, double suction multi-stage pumps, open runner paper stock pumps, and axial flow pumps.

◆

Seamless New Boiler Tubes: A new, 24-page condensed catalog on B&W seamless steel boiler tubes, alloy tubes and pipe for refinery and process industries, stainless steel tubes and pipe, and seamless steel mechanical tubing is being distributed by The Babcock & Wilcox Tube Company. This booklet describes, with photographs and schematic line diagrams, the seamless tube manufacturing process; refinery and process industries applications of B&W seamless Croloy and other alloy tubes and pipe, and descriptions and applications of B&W stainless steel tubes and pipe, and mechanical tubing.

Those desiring a copy of Bulletin

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TB-319, write to The Babcock & Wilcox Tube Company, Beaver Falls, Pa., on your company letterhead.

Materials Handling Equipment, for use in central stations, construction projects and industrial plants, electric motors and controls for cranes, hoists and gantry bridges are described in a new 20-page pamphlet (Booklet B - 2264, Department 7 - N - 20) just published by Westinghouse Electric and Manufacturing Company.

Features of ac and dc motors up to 600 horsepower for typical materials handling operations are discussed with a note on gear motor applications. Controllers, protective devices and methods of motor braking are described and illustrated.

A two-page application chart facilitates the selection of motors and control for typical materials handling operations as found in steel mills, central stations, construction projects and industrial plants.

Metallic Packings for Navy Service, a 12-page, beautifully illustrated booklet in three colors; published by the Crane Packing Company, and setting forth the advantages of the various styles of John Crane metallic packing as approved by the U. S. Navy. These included: Style 6 A. M., for highpressure superheated steam; Super Seal No. 1, for steam or water pumps; Style 140, for stern tube service; Style 250, for reciprocating steam rods; Style 150, for wet steam, fuel oil, etc.; Style 100, for rotary steam and air-compressor service; Style 300 for hydraulic plungers; Style 77 CK for electric cable stuffing boxes; Style 77 MC for watertight closures; John Crane metallic condenser packings; John Crane special condenser packings; and John Crane fittings.

Howard Asp is manager of the San Francisco branch of the Crane Packing Co.; and Ray Roshong presides at the Los Angeles branch.

Marine Valve Catalog, a new compact and colorful catalog of cast and forged steel valves for marine service has been issued by The Edward Valve & Mfg. Co., Inc., East Chicago, Ind.

Containing data and illustrations on Edward steel stop, check, blow-off, stop-check, non-return, gage, straight-through, hydraulic and relief valves and strainers, the catalog appropriately follows a red, white and blue color scheme.

The latest Bureau of Marine Inspection and Navigation adjusted pressure-temperature tables for marine service are conveniently reproduced on the back cover for easy reference.

Catechism of Electric Machinery: Those who are not familiar with electrical phenomena or terminology can acquire a good working knowledge by reading the 48-page "Catechism of Electrical Machinery," recently published by Fairbanks, Morse & Co. in a new, revised edition.

The "Catechism" begins by explaining electricity and magnetism as utilized in electric generators and motors, and goes on to discuss important electrical measurements. The principles of direct-current generators and motors are presented next, followed by an A-B-C examination of alternators and alternating-current motors. Illustrations, including simplified diagrams as well as photographs, are generously used as aids to clear understanding. Useful tables of practical application are included.

Copies of the "Catechism" are available gratis upon request on your business letterhead to Fairbanks, Morse & Co.

H.-O.-H. Booklet on Water. D. W. Haering & Co., Inc., has just published a 48-page booklet of articles on scale, corrosion and water treatment problems, reprinted from a selection of the most interesting and popular discussions to appear in the company's well-known house organ, H.-O.-H. Lighthouse.

Profusely illustrated, the booklet provides important information including tables, charts and graphs on water problems occurring in cooling systems, hot water systems, boilers, and return systems including special data on corrosion inhibitors, scale preventives, protective coatings, proportioning equipment and refrigerating brine problems.

Provided in a new format in a convenient pocket size, the new H-O-H Lighthouse reprints catalog is being distributed by D. W. Haering & Co., Inc. without expense or obligation to chemists and engineers addressing requests to the company on letterheads or indicating the nature of their interest in water.

Pacific MARINE REVIEW

November
1941

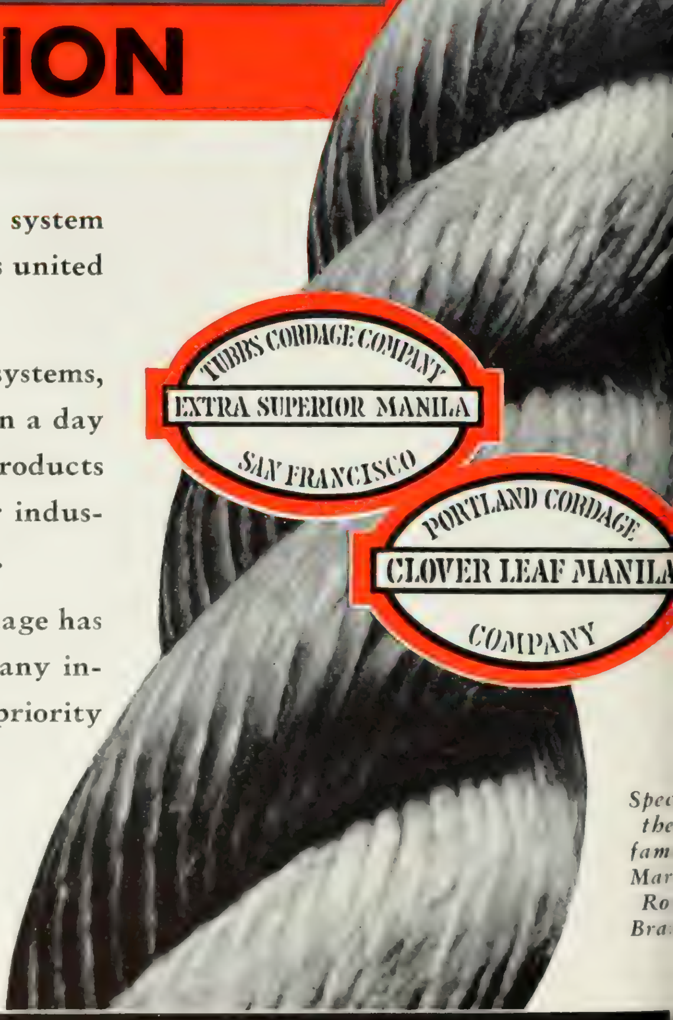
On the Job with America's Defense

TRANSPORTATION

In today's emergency, every form in America's system of transportation . . . land . . . air . . . water . . . is united in its all-out effort for our country's defense.

In the operation of these great transportation systems, rope plays an important part. We are working on a day and night schedule to keep a steady flow of our products going to the field of transportation and to other industries of the West essential to America's defense.

Because of its importance in defense, Manila cordage has been placed on a priority basis by O.P.M. for many industries. The marine field, however, enjoys full priority consideration and both Tubbs Cordage Company and Portland Cordage Company pledge their full and complete cooperation in supplying your rope needs.



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Pacific MARINE REVIEW

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Official Organ

Pacific American Steamship Association

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Shipowners Association of the Pacific Coast

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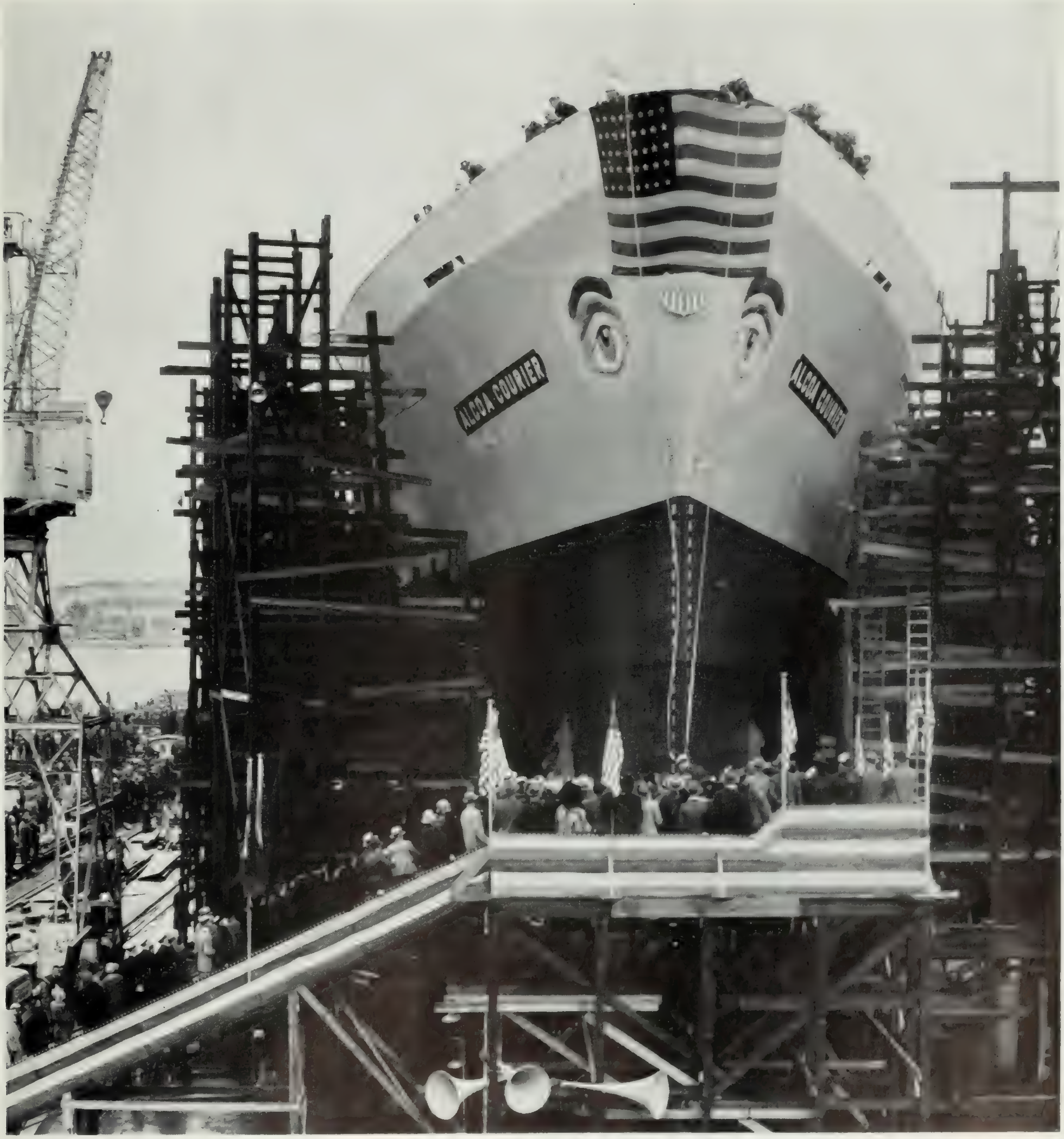
San Francisco Observes Navy Day

Commemoration of Navy Day in San Francisco was climaxed by a luncheon meeting jointly sponsored by seven Maritime and Civic organizations. Distinguished speaker was Rear Admiral J. W. Greenslade, U.S.N. His topic "Sea Power and Our Navy of Tomorrow." Chairman of the event was Walter J. Walsh, seen at the left of the speaker



SS ALCOA COURIER

The Moore Dry Dock Company of Oakland launched the S.S. ALCOA COURIER *on October 21st, timing the event for the day when hundreds of the Nation's leading ship-operating, shipbuilding and Maritime Commission notables were in the San Francisco Bay area for the opening of the Propeller Club Convention-American Merchant Marine Conference. The vessel, 420′ x 62′, DWT 6600, was constructed for the Alcoa Steamship Company by the U. S. Maritime Commission*

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Pacific
MARINE
REVIEW

POST-WAR

American Foreign Shipping

by Rear Admiral Emory S. Land

Chairman, U. S. Maritime Commission

The recent and present kaleidoscopic changes in the world's political and economic structure have brought with them two foreign trade problems for the United States.

One was the immediate problem of adjusting our shipping and our import and export business to meet the emergency needs of our own national defense and of our aid to the democracies with as little dislocation as possible. The other is the continuation and readjustment of our original peace-time program to meet post-war world trade conditions, and, insofar as possible, emerge from the war period with the United States safely and surely reestablished as a dominant maritime nation.

The immediate problem has considerable bearing upon an ultimate solution of the post-war problem. The present shortage of tonnage is serious and will continue until our shipbuilding program meets the needs of our own nation and those of the embattled democracies. These programs are expected to produce about 1200 new ships of more than thirteen million deadweight tons by the end of 1943.

A report from Great Britain, as of October 1, states that sinkings in July,

Tanker Robert C. Tuttle with 155,000 barrels of crude oil from Texas discharging at the new marine terminal of the Atlantic Refining Co. at Philadelphia

August and September were only about one-third of those in the preceding three months, April, May and June, a reduction of about 472,000 tons from the previous three-month total of about 1,416,000 tons. Our entire ship production program contemplates six and one-half million tons in each of the years of 1942 and 1943, a total sufficient to replace the sinkings at the peak rate for 1941 and more than ample to make those replacements if future losses are held to the present reduced level.

Every ship that comes off the ways and every ship which is saved from the bomb, shell or torpedo of an Axis raider, helps our shipping situation just that much. With production increasing and sinkings decreasing, the American Merchant Marine should be able within the next few months to overcome many of the handicaps which have been hampering movement of our commercial foreign trade cargoes.

Meanwhile, the Maritime Commission has sought to meet the nation's most imperative shipping needs, including those of importers and exporters, through its Emergency Shipping Division, directed by—executives drafted from large American operating companies—men who understand from long experience foreign trade requirements. Their business has been to use every available American flag bottom and some foreign flag vessels to move strategic materials into the United States for the production of war materials both for our own defense and for shipment to Great Britain and her allies.

The Neutrality Act

The Neutrality Act made inoperative nine of the thirty trade routes set up under the Commission's original plan. These nine routes were to Europe and the Mediterranean area. On the other hand, the others are in full operation, many of them on a greatly expanded basis. There were on January 1 of this year 141 ships, totaling 832,673 gross tons, in service to both coasts of South America, Central America and Mexico, and the West Indies. On September 1, in the same services, there were 209 ships, totaling 1,105,284 gross tons.

It is true there has not been sufficient tonnage to meet in those trades all of our foreign trade requirements and those of our defense program as well, and that is equally true in all of our other trades. Our effort, however, has been directed toward uninterrupted, even though diminished, supply of important commercial cargoes from the United States to our overseas trading areas and from those areas to our nation. We have felt this course to be necessary for the continuance of international good will, particularly in the Western Hemisphere.

We realize that our markets must be held, and the Maritime Commission's Emergency Shipping Division is making every effort to prevent disruption of trade and loss of those normal markets.

Priorities and Allocation

There is no question but many lines of export and import trade are feeling acutely the result of priorities and allocations, which are being made to expedite our all-out National Defense Program. Most of the shippers undoubtedly recognize the urgent necessity for these rulings with which the Maritime Commission, as well as the shippers, must comply. Priorities are administered by the Office of Production Management, which is the Government directive agency dealing with defense production schedules and with acquirement of raw materials needed for them. This agency informs the Maritime Commission of the types, quantities and location of critical and strategic materials to be moved, and the Commission places ships as rapidly as possible in position to lift those cargoes.

The OPM, in order to facilitate the importation of these critical and strategic materials, has organized the Shipping Imports Advisory Committee, composed of representatives of those Government departments vitally concerned with administration of the defense program. It is in this group that recommendations as to movements of homeward-bound cargoes originate. Imports of commercial goods listed as non-essential to the National Defense Program are moved homeward when, as and if space is available above requirements for essential materials. There has been, as a matter of fact, quite limited space available for non-defense materials in virtually every trade.

There is no priority system, as such, on outward cargoes. The trades to Latin America, South Africa, Australasia and the East are operated on a commercial scale, and (with some minor exceptions) are governed on the first-come first-served basis. There are some minor exceptions. The Commission has arranged for such special demands as the movement of large amounts of coal to the east coast of South America. Where such contingencies arise, the Emergency Shipping Division makes every effort to meet them.

Lease-Lend Materials

The outbound movement of Lease-Lend materials is controlled largely by the needs of governments to be aided. The Maritime Commission has been able to exert some influence on the routings of these materials to help in avoiding port congestion in this country and to obtain equitable distribution of the trade to appropriate ports. Every effort is made to conserve ship time and to obtain transfer of commodities to ports offering the shortest sailing distance. All of our ports are at this time in liquid condition and there is no foreseeable danger of overcrowding. It is well for the shippers, however, to bear in mind that the Maritime Commission is merely the transportation administrative agency in our foreign trade conduct and not the originator of priorities rulings.

Post-War Problems

Turning to the post-war problem, we are confronted with a far greater degree of uncertainty. The world conflict has not developed to the stage where even the most astute and intrepid observer is willing to venture a prediction as to when Hitlerism and all that it implies will be crushed. When that time does come, however, the American merchant marine must be in a position to occupy a dominant place, particularly in trades directly affecting the United States. One fact is self-evident—that we cannot hope to take that position unless we have ships, good ships and plenty of them. We must be in a position to meet every economic competitive condition which confronts us—just as we are preparing to meet every defense contingency.

War and its attendant barriers to normal commerce, as well as the legislative action it has induced in our Congress, has had a narrowing effect on our trade horizons. Peace and the accompanying effort by all nations to reattain normal economic status will bring a broadening of those horizons as a logical result. American merchant ships must be available and ready to carry a greater proportion than ever before of the resultant world commerce. That is the goal toward which the shipbuilders and the ship operators of this nation are headed—the *ultimate* goal toward which the entire program of the Maritime Commission is directed.

The shipyards of the nation are geared up to a standard of production which assures success of the construction phase of our effort. We are building Commission standard design C-type cargo ships and tankers that will meet every demand for speed, efficiency and economy in operation. They will fill this nation's foreign trade needs, no matter how much expanded, for at least two decades. Even the emergency cargo vessels—the "Liberty ships"—we are building, though they are termed, on a competitive basis, "five-year ships," can play an important part in post-war world commerce. On the less competitive trade routes, particularly during the era of world reconstruction, those emergency vessels will be able to render long and capable service. No matter what their ultimate destiny, they will, without question, prove a good investment for the nation.

The post-war program of the Maritime Commission is based on the sound policy that we must reassume and maintain our rightful position on every essential trade route for our foreign commerce; that we must direct our peacetime policy toward the retention of the foreign trade which the war has brought to us and the acquisition of other foreign markets in a much greater degree than ever before to absorb the increased exportable surplus of commodities our industry has been geared up to produce.

Foreign trade maintained throughout the world with proper shipping facilities to place it on a competitive parity with all nations, is, in a great degree, the solution to that problem. The program of the Maritime Commission since 1937 has been and is designed to place American world-trade shipping in a proper position of preeminence.

Abstract of address before National Trade Convention, October 6.

Mrs. Emory S. Land christens the Ocean Vanguard

Mud Flats To

TODD-CALIFORNIA CORPORATION DELIVERS FIRST BRITISH EMERGENCY TYPE STEAMER

Before this article is in print, the Todd-California Shipbuilding Corporation will have delivered their first vessel, and before 12 months have elapsed from the time they broke ground for their shipyard at Richmond, California, that yard will have delivered four or more good cargo steamers.

The pictures reproduced with this article show the progress record of the Ocean Vanguard, Hull No. 1, at this yard.

On December 20, 1940, the Todd-California Shipbuilding Corporation had received a contract from the British Purchasing Commission to build 30 steel cargo vessels of 11-knot speed, powered by triple-expansion engines taking steam from single-ended, coal-burning, Scotch type marine boilers. On January 14, 1941, ground was broken on a 48-acre site on the inner harbor of Richmond, on the east shore of San Francisco Bay. The site at that time was mostly marsh land and partly tidal flats. The winter of 1940-41 was a very wet time in Central California and almost immediately after ground breaking, the site became a sea of mud. However, the men and the machines operating on the construction of this yard were accustomed to doing hard tasks, and in 90 days from ground breaking, they were ready to lay keels.

CHARACTERISTICS OF "LIBERTY V" TYPE

Length on W. L.	427′ 0″
Length B. P.	416′ 0″
Beam molded	57′ 0″
Depth molded	37′ 4″
Load draft (about)	27′ 0″
Gross	7,200 tons
Displacement about	14,000 tons
Deadweight capacity	10,000 tons
Propulsion power	2500 ihp
Service speed	11 knots

Two big Whirley cranes lower one of the boilers to its place in the hull

On April 14, the first keel was laid. This record is all the more noteworthy, since 50 consecutive days in February and March, it rained some every day, and most of those days it rained all day.

On August 16, the first hull was launched with very appropriate ceremonies and exercises. She was christened Ocean Vanguard by Mrs. Emory Land, wife of the chairman of the U. S. Maritime Commission. At her launching she was said to be 85% complete.

On October 16 and 17, she completed satisfactory sea trials and was scheduled for delivery October 25, a little over six months from the day her keel was laid, and a little over nine months from first breaking ground for the construction of the shipyard in which she was built.

For a new yard and a first ship, these are remarkable records, and, when we assure our readers that the workmanship is excellent, and everything about the vessel is in first-class order, we think that they will agree with us that the personnel and the management of the Todd-California Shipbuilding Corporation are rightly proud of this record and worthy of high praise.

The standardized vessel that is being produced has been variously designated as an "Ugly Duckling," "An Emergency Type," "A Liberty Type," and so on. As a matter of fact, it is a

Deliveries In Ten Months

simple cargo vessel built somewhat lighter than standard, and with some features added which make it more adaptable to convoy work in war time.

At the request of the British authorities, we refrain from publishing any photographs which will show these additions and also refrain from description. The feature of most interest to oldtimers in these vessels is the power plant—a modern version of the plant with which most of the marine engineers, now 45 years or older, first went to sea.

The engine is a big three-cylinder, vertical inverted triple-expansion unit with cast-iron columns, and condenser hung on the port columns. This engine has cylinders of 24½″×37″×70″ bore, and 48″ stroke, and is fitted with piston valves on the high pressure and balanced slide valves on the intermediate and low pressure cylinders. It develops 2500 horsepower when running 76 rpm on 220 psi steam at 575° F.

It is a "Hamilton Marine Steam Engine" built by the General Machinery Corporation at Hamilton, Ohio.

Steam is generated in three single-ended Scotch boilers, arranged forward of the engine and with the stoke hold running athwartship and separated from the engine room by the boilers and a light bulkhead. The backs of the boilers are close up to the forward end of the engine so that the main steam pipe is very short. These boilers were built by Western Pipe and Steel Company in their Los Angeles plant.

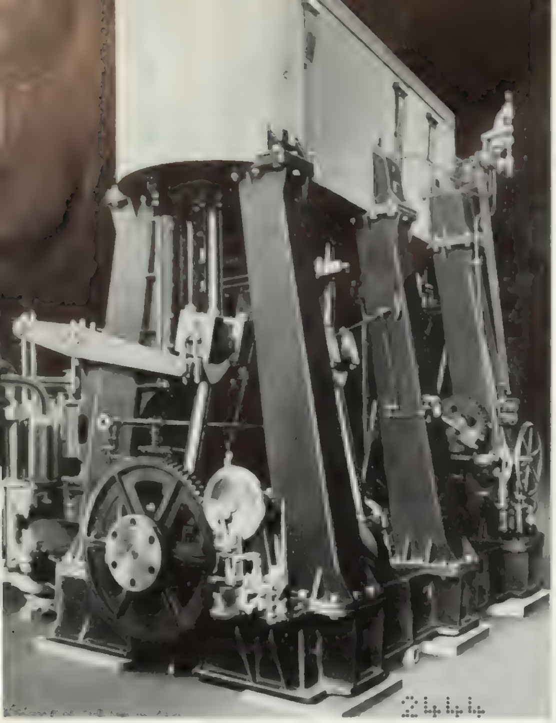
We have no figures for the coal consumption on this engine but understand it is very satisfactory. The speed

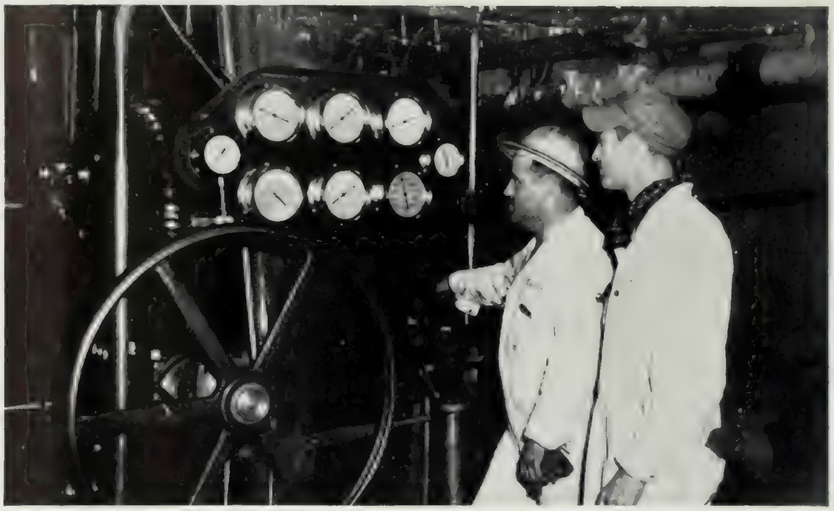
THE PICTORIAL HISTORY OF A SHIPBUILDING WAY

Top: Excavation, January 24, 1941

Center: Keel laying, April 14, 1941

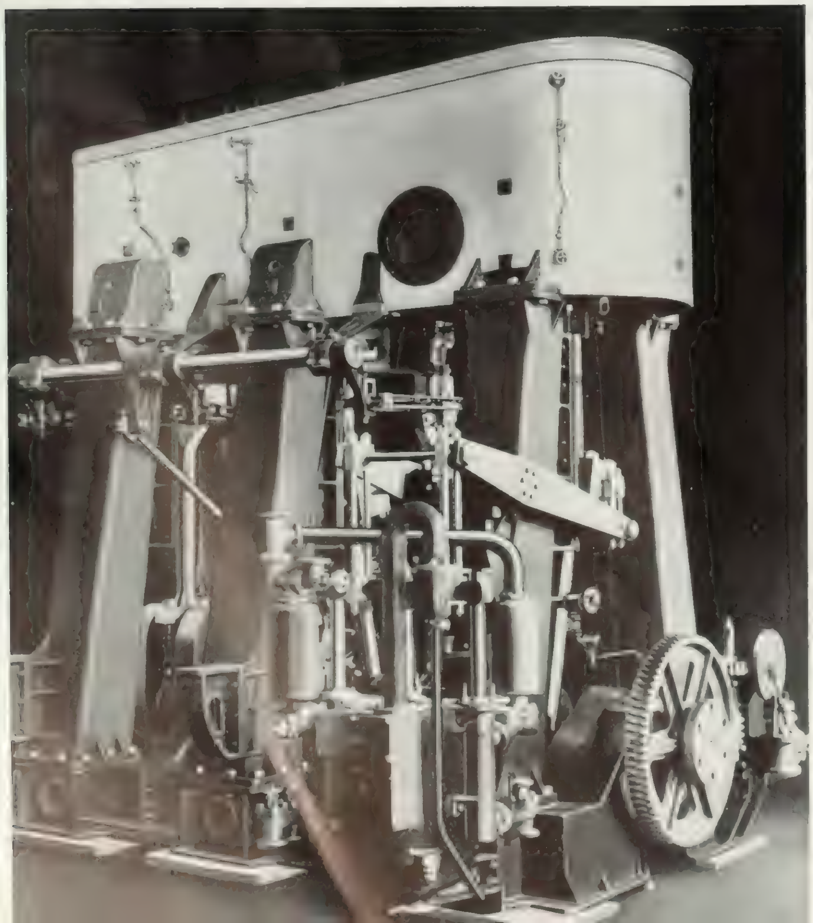
At right: Launching, August 16, 1941





Above and below: Two views of the triple-expansion engine of the S. S. Vanguard as set up in the erecting shop of its builders. Note the lever-driven air pump, and the brackets for the condenser

At right: Upper view shows some experts adjusting compass; lower, the control stand in the engine room



attained on trials exceeded the requirements.

The direct-steam drive vertical air and condensate pump and the direct-steam drive feed pump are old friends, but the oldtimer was most intrigued by the beautifully built little single-cylinder vertical steam engines by Sturtevant, driving the induced-draft blowers, the centrifugal pumps, and the electric generators.

Notable in these ships as compared with the standard U. S. Maritime Commission vessels is the simplicity of the electrical installation. Two 25-kw generators, each driven by a direct-connected, single cylinder, vertical steam engine, take care of all electric lighting and power.

Accommodations for crew and officers are very comfortable, well equipped, furnished with hot and cold running water, and adequate sanitary facilities. The interiors are finished in white with oak trim. Fuller's paint is used.

On the bridge is adequate provision for navigation.

Four lifeboats are hung on Welin Crescent davits on the bridge deck.

one boat being equipped with an inboard motor propulsion plant.

Cargo-handling gear is of the standard type with American Hoist and Derrick steam winches. Steam windlass and steam steering gear are of the usual type.

These vessels should be extremely useful in the present emergency. They are a handy size, have ample steam capacity, should be able with a clean bottom to maintain their rated speed in almost any weather, and in calm sea could probably exceed that speed by a knot or two for a fairly sustained period. They also have the advantage of being able to obtain adequate emergency repairs at almost any port on the globe.

It is rather interesting that that grand old Scotch engineer, by the name of Kirk, perfected the first practical triple-expansion engine installation in (1881) the same year that Edison installed his first practical incandescent electric lights. The majority of the marine steam power plants of the world were triple expansion steam by 1890 and are so to this day.

So in every port of the world, you will find still some Scotch Chinaman, or Scotch Portuguese, or Scotch Jap, or Scotch Kaffir that sabes Scotch boilers and triple-expansion engines.

For these reasons, and also because of the tremendous volume of turbine and gear orders that are ahead of these vessels, both the British Purchasing Commission and the U. S. Maritime Commission decided to put reciprocating triple-expansion engines on the ships of the emergency fleet, for which there is such desperate and immediate need.

The new shipyards, of which Todd-California is an excellent example, are showing remarkable progress and we will soon see the ships sliding off the ways at the goal rate set by the Maritime Commission of two a day. Already the rate is better than one a day for October, 1941.

We salute Todd-California for the first delivery of the "Liberty V Fleet" and venture the prediction that these vessels are indeed harbingers of victory for the cause of democracy.

Upper left and lower right: The Vanguard on her trials in San Francisco Bay

Upper right: Mr. C. P. Bedford, general manager, Todd-California Shipbuilding Corp.; Harry Friel; and a group of British inspectors

●

The smoke and the fog make artistic pictures, but we assure our readers that these views do not represent the normal conditions of the stack of the Vanguard

●

American Sailor Training Station

A MODERN EFFICIENT SCHOOL FOR MARINE TRAINEES AT HUENEME, CALIFORNIA

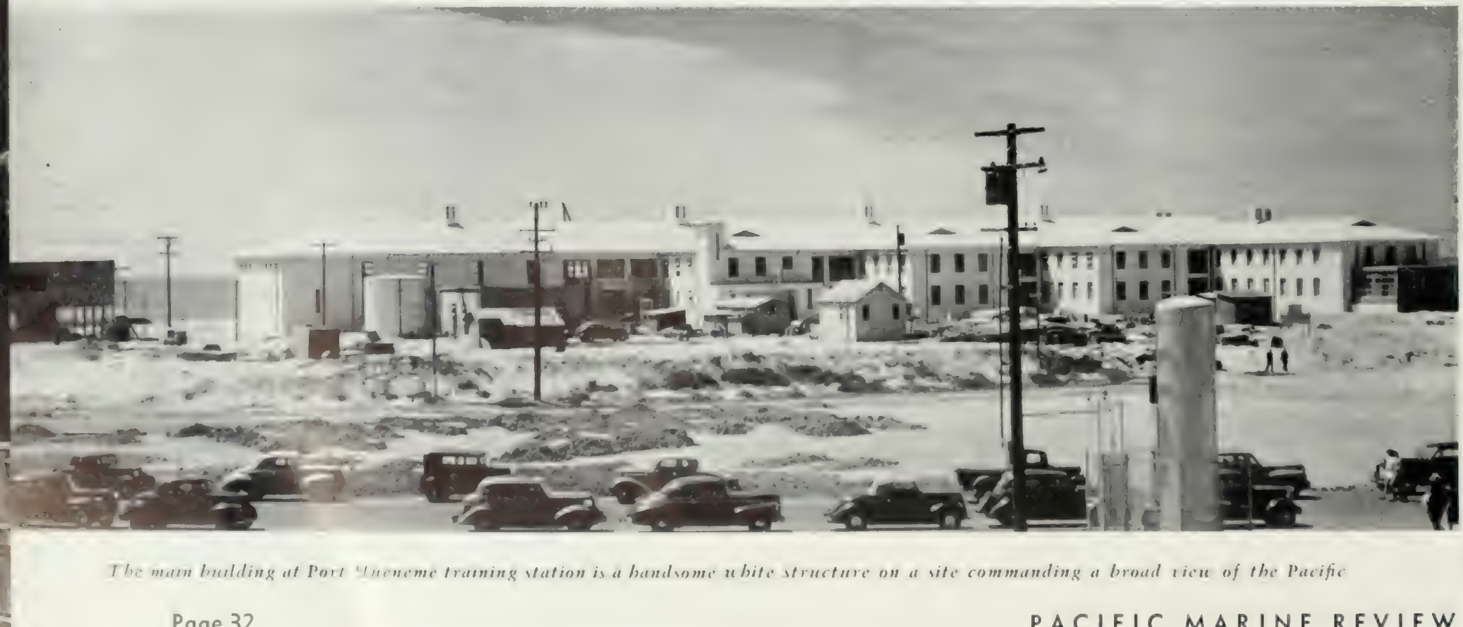
The new seaman apprentice training station at Port Hueneme, Ventura County, California, is now functioning as the shore station and base for the training ship American Sailor, and as the shore home and school for U. S. Maritime Service trainees and their officers and instructors.

This training station is one of the institutions built and financed by the U. S. Maritime Commission. As with all of its special training work, this division builds the training station, provides the training ship, finances the operation, but turns over the actual training and educational work to the U. S. Coast Guard Service.

In our September issue, we published a complete illustrated description of the American Sailor, which arrived at Port Hueneme from the Atlantic Coast on August 30, with a full complement of trainees aboard. Here we present an illustrated account of her shore-side base. The ship herself was converted and equipped for training purposes at a cost in excess of $1,600,000, and the shore-side building erected by the Zoss Construction Co. of Los Angeles, cost in excess of $1,000,000.

Standing on the Government reservation at Port Hueneme, the school building faces directly west, looking out at the lighthouse and the Pacific Ocean beyond. As will be noted in the illustrations, this building is a beautiful white two-story structure, composed of a central colonade with four wings extending on each side.

This central part has a length of 426 feet and the wings have an overall spread of 270 feet. It is designed to accommodate the administrative and educational officers of the school and 300 trainees.



The main building at Port Hueneme training station is a handsome white structure on a site commanding a broad view of the Pacific

School Administration

The U. S. Coast Guard operates the training station at Hueneme, and here are the administrative officers:

Top: From left to right, Dr. Loren T. Clawson, U. S. Public Health Service assistant dental surgeon; Lieut. H. B. Roberts, U. S. Coast Guard, executive officer; Lieut. Gilbert I. Lynch, U. S. Coast Guard, training officer

Right: Captain W. F. Towle, U. S. Coast Guard, commanding officer

Bottom: Left to right, Lieut. LeRoy Elwell, assistant training officer; Pay Clerk Leon R. Duclos, U. S. Coast Guard, supply officer; Pay Clerk Thomas Zeller, U. S. Coast Guard, finance officer

Top: Trainees from American Sailor marching ashore

Center: Left to right, Hueneme Port Director R. R. MacKenzie; Lieut. Comdr. A. C. Richmond, commanding officer, American Sailor; E. O. Green, Oxnard Harbor District Commissioner

Right: American Sailor entering Hueneme

The main entrance at the west end opens into a spacious lobby with the administrative officers in the south wing and the school hospital in the north wing. Here all the rooms are spacious, beautifully furnished and well equipped.

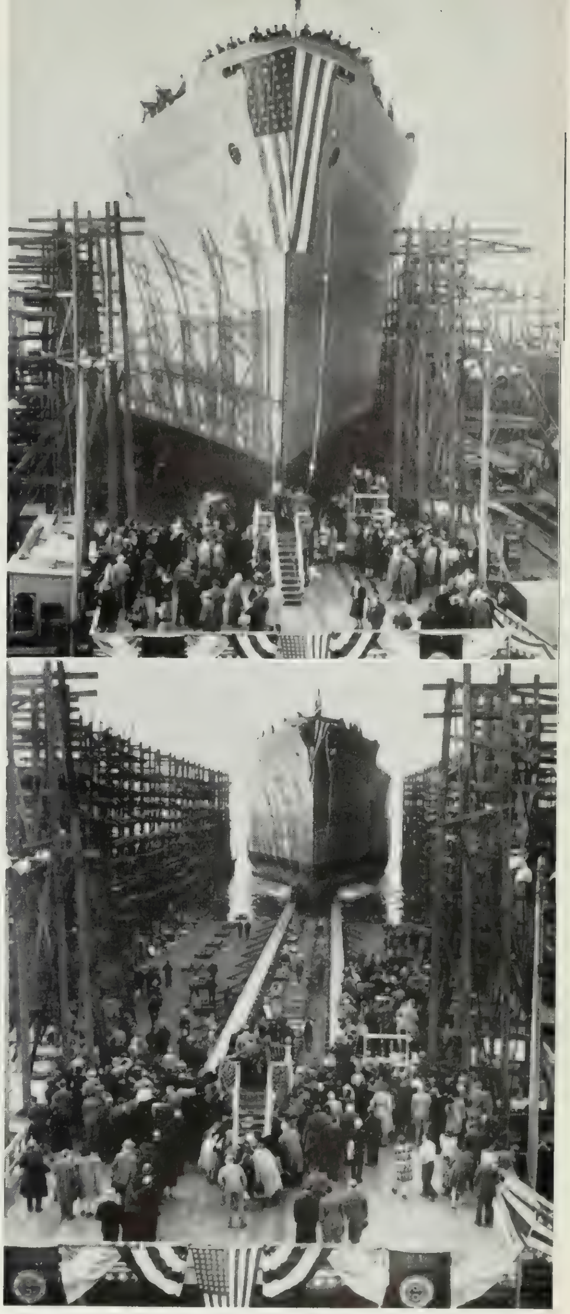
From the lobby a broad hall leads east and connects with all the wings. These wings on the first floor level are dormitories for trainees.

At the east end of the central hall is a large auditorium, said to be the finest in Ventura County. This room is equipped for sound motion pictures and other recreational and educational features. As will be noted in the illustration, the auditorium runs up the full two-story height of the building.

On the second floor are located the school classrooms, the galley and pantries, the trainees' mess, the officers' mess, the officers' bedrooms, and more dormitories.

When the grounds are landscaped and the gardens and lawns flourishing, this will be a very lovely spot. It enjoys the finest climate to be found anywhere, and its trainees are very fortunate young men. They receive a seven-months' intensive training course, three months of which is spent cruising on board the American Sailor. During this seven months, they have choice of four courses. Depending on their choice, they are taught to be: good able-bodied seamen (deck hands); good ship's stewards; good firemen; or good oilers.

They are fed, housed, and taught without charge, and are paid a nominal wage while they are learning.



Tacoma Yard Launches Steel Architect

True to its performance schedule, the Tacoma plant of the Seattle-Tacoma Shipbuilding Corporation on October 21 launched the second of its C-3 type of Maritime Commission vessels, the Steel Architect, indicating rapid progress on the contract which this yard has for building a fleet of 36 of these vessels.

As the launching took place, just west of the Steel Architect, another vessel was already beginning to assume tangible form, and immediately to the east was another whose keel was laid only three weeks ago, following the launching of the first C-3, the Army transport Frederick Funston. The Steel Architect was christened by Mrs. Walter M. Wells, wife of the vice president of the Isthmian Line, the company which will operate her.

Together with the Frederick Funston, Steel Architect is the largest of the vessels launched so far at the Tacoma yards, but there are 36 more coming. She has a displacement of 17,615 tons, deadweight of 12,527, is 492 feet long, sixty-nine feet beam and forty-two depth. The five C-1 ships already built at this yard displaced only a little more than 12,000 tons.

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Upper left: Mrs. Walter M. Wells, attended by her husband and Mr. Greene, ready to christen the ship

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Right, top down: Ship ready for launching; ship afloat; ship being shunted to outfitting dock

Our Merchant Marine

DISINFECTS NAZI PROPAGANDA

by Robert C. Lee

When the United States Maritime Commission three years ago embarked on its program calling for the construction of five hundred ships in ten years, there were a lot of people who thought that the Commission was unduly optimistic. There did not seem to be any place where these ships could be profitably employed. The various American operating companies were urged to take commitments for the first deliveries of these vessels, and the American Scantic Line, which my company was then operating to Northern Europe, boldly launched a program to acquire six of these vessels. Shortly thereafter, we were able to dispose of our old fleet and greatly expanded our commitments for new ships. Then the war came.

From the Moore-McCormack Lines alone, the Navy has taken sixteen of these new ships. From other lines, both the Army and the Navy have drawn ships, and there can be no doubt but that these ships were taken from commerce and converted to men-o-war only because of the urgent need of defense of our country. We are not yet in the war, and, in fact, there is a great deal of criticism about the slowness of our preparing; nevertheless, the merchant marine has already demonstrated the vital role it has to play.

The Maritime Commission has found that instead of five hundred vessels in ten years, it has been called upon for eight hundred vessels in three years, with the demands upon it for new tonnage increasing every moment. Had it not been for the far-sighted policy of the United States Maritime Commission well prior to this war to get its ship designs completed and awaken activity in many of our shipyards by beginning building, this country would indeed have been in a sad plight today. As it is, we have been able to handle most of our commerce, we have been able vastly to expand our shipbuilding facilities without the chaos and wastage of the last war, and we have been able very materially to help England in her desperate fight. The Navy would have been a lame duck indeed were it not for the forthright action of Admiral Land and his associates long before the war clouds began to gather.

Robert C. Lee
Moore-McCormack Lines

And the end is not yet. As a matter of fact, it is probably just the beginning. Without doubt, the balance very probably hangs upon the ability of the merchant marine to come through. Russia is making a gallant fight, but it is perfectly evident that she cannot hold her lines indefinitely. They must be relieved in two ways—by new material gotten to her in merchant ships and by diversion elsewhere, probably on the Continent, but possibly in Asia Minor, but wherever it is, wholly dependent upon the assistance that must be rendered by merchant ships.

The merchant marine service has two very clearly defined functions in defense. I have dwelt so far entirely upon the military aspects of this defense, but the non-military, or rather purely commercial aspects, are of equal importance.

The political philosophy of the Nazis has some slight hold in the United States today. Were they triumphant, this hold would certainly broaden. But the hold today is infinitely stronger in South America. A victorious Germany would bring South America into her orbit with very little difficulty and with great rapidity. What's left? The United States, an armed camp standing against the world, probably with only Canada and Australia friendly. How long do you think we would stand up under those conditions?

Now, the merchant marine has a part to play in this political warfare and we are playing it. Rapproachment with South America has been rapid and successful in the past few years, but the vanguard leading the way and making it possible have been the merchant ships of the United States. Without these American merchant ships now plying the seas between the United States and South America the present healthy state of affairs in the Western Hemisphere would not exist. Several important countries in South America would be in economic chaos, easy prey for Nazi philosophy.

You who live in a great industrial state where steel is so important a factor in your economy will appreciate the danger emanating from a lack of manganese. Yet this very important item, produced in volume in Brazil, never would have reached your mills in the last two crucial years were it not for the fact that the Maritime Commission launched its building program and assured the availability of space for its transportation to our ports.

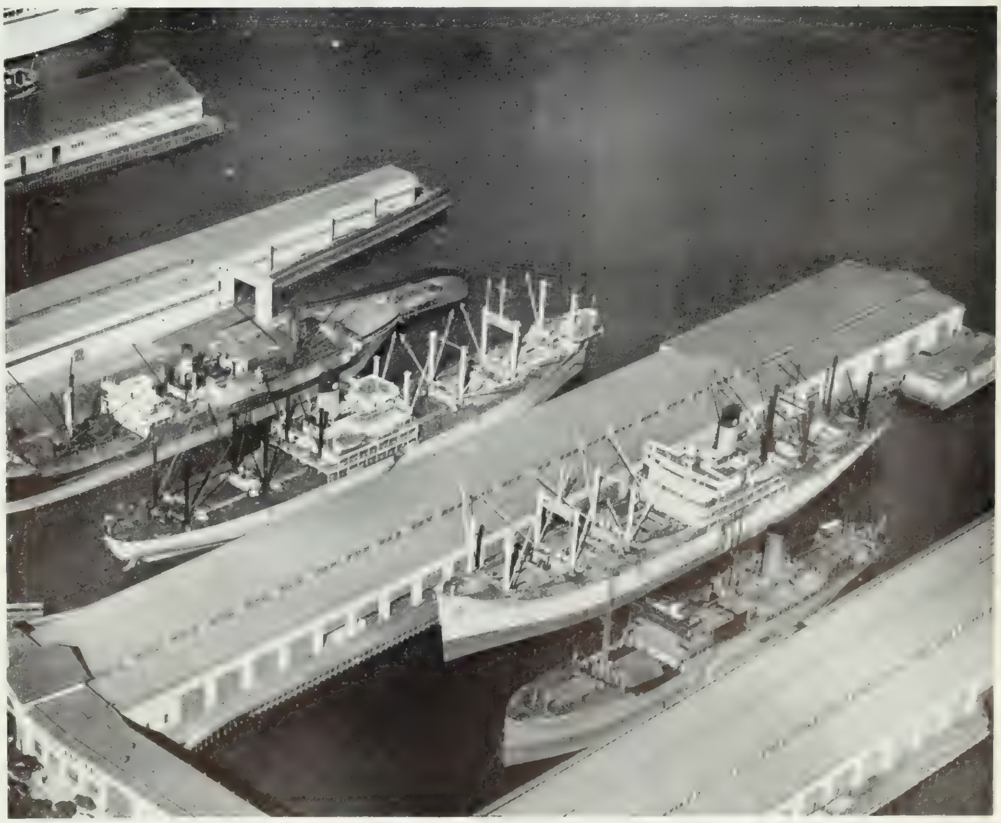
Take another defense item, wool. The records of my company in the last year have shown consistently improved records in the movement of wool from Argentina to the ports of New England. For volume of wool and speed of delivery, a new record has been established almost every time one of our new cargo liners, built according to the most modern plans, has docked at the port of Boston. Imagine a nation preparing as we are for what seems almost inevitably an active part in a great war, lacking in a sufficiency of wool; and that we are not lacking in it today, credit to our merchant fleet loading at the River Plate ports of Buenos Aires and Montevideo and speeding north with their precious cargoes. I could go on expanding this list; it would touch our defense program at some of its most vital points.

Remember that South America depended largely upon the nations of Europe both for materials and markets, prior to the war. We were secondary in many ways, in the South American economic picture, for reasons that are obvious. We produced at home many of the goods produced in South America, and thus were not buyers; we were unable because of competitive costs to sell certain of our products in South America. Europe, on the other hand, was able to buy or sell in many instances where we were not, and thus keep the economy of our neighbor countries in some state of balance, even though it was not perfect.

Suddenly the war cut off Europe both as supplier and as market; commercial ships linking South America with Europe were sharply reduced in number and frequency of sailing. There was no one but this country to turn to. Suppose we had been lacking in tonnage to throw into the breach; suppose we, with our merchant marine depleted as it is by the demands of the Government, had to give South America nothing but a shrug of our shoulders in her hour of emergency. With the expertly organized Nazi propaganda functioning already in South America able to point to us as mere fair-weather friends with no time or space to devote to her when she needed us, we would have been set back so far in our inter-American relations as to ruin any hope of acceptance in that market during the post-war years that are ahead. Fortunately, we have been able to take her cheese and fruits and wool and similar products and get to her a fair share of the goods she needs, and again we can thank our merchant marine for a job in maintaining practical, Good Neighbor relations.

It seems incredible that an Austrian house painter could propound a form of government that would in any way jeopardize a government like ours which has resulted from the combined thought of educated, experienced, cultured men drawing upon all past history, the forefathers and founders of this great nation. But we must recognize in the world today a great mass of people who hate to think and hate to sweat and look upon a paternal government as a haven of refuge, failing to see that such a government is a Moloch devouring them. There is an additional number educated beyond their capacity to absorb education. There is probably also an ever-widening circle of just plain lunatics and scoundrels. The democracy of the United States cannot withstand the shock of the combined attack of these groups unless we are ready to take the punishment that withstanding calls for. The American merchant marine has been a part of the glorious tradition of this country. In this present crisis it is doing its full duty. It is beholden that all other industries do likewise.

Abstract of an address before York Traffic Club, York, Pa., October 9, 1941.

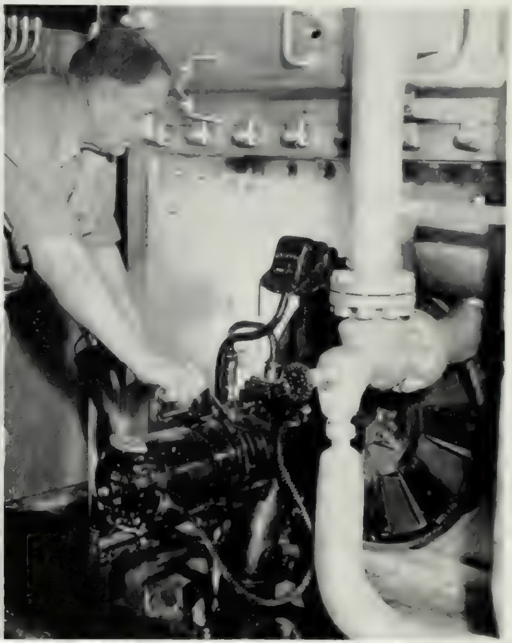


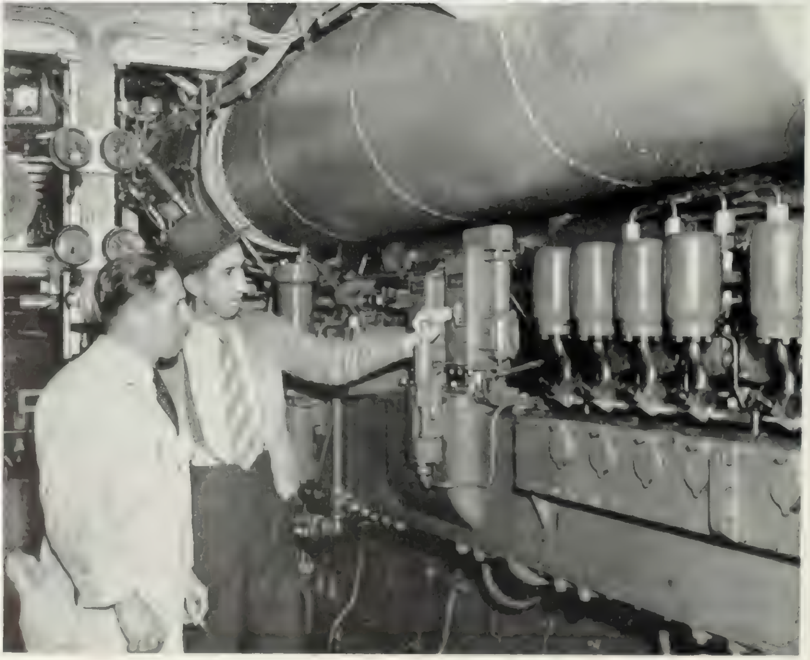
MOORE-McCORMACK LINERS AT SAN FRANCISCO

Two out of three C-3's, built by Moore Dry Dock Company for Moore-McCormack Lines' South American service, arrived in San Francisco on Sunday morning, October 12, one from the Northwest, and one from South America. Both docked at Pier 38 within an hour and shortly thereafter the air camera caught some interesting pictures of these two vessels lying abreast of each other alongside their pier. The schedule of these vessels is such that this meeting on the same day at the same place could not possibly occur once in a great many months or even years. Furthermore, they remained together less than two days.

Personalities

Passing under San Francisco-Oakland Bay Bridge, American Packer is heading for the Golden Gate and her first sea trial, while these five gentlemen seem to be interested in the huge suspension bridge. They are, left to right: Bill Lobeley, American Bureau of Shipping; David Mowatt, Western Pipe and Steel yard superintendent; Bill Griffin, U. S. M. C.; James Paine, U. S. M. C. electrical inspector; and Henry Hook, chief electrician





on the Trial Run of the AMERICAN PACKER

Bobby Massenburg and dad

The American Packer is last of a series of five C-1-B type motorships built at the South San Francisco yards of the Western Pipe & Steel Company. She was delivered October 10, after very successful trial runs, during which her machinery and equipment were thoroughly tested.

Previous issues have carried completely illustrated descriptions of these vessels, all five of which were allocated to the United States Lines. They were named, respectively, American Manufacturer, American Leader, American Builder, American Press and American Packer.

These five ships are completely welded and are the largest vessels so fabricated and erected on the Pacific Coast.

The power plant consists of two 2250-bhp Busch-Sulzer diesel engines. Each engine drives one of the pinions of a Farrel-Birmingham single-reduction gear set, the gear wheel of which is mounted on the propeller shaft. Between each engine and its pinion is an Elliott electric-dynamic coupling.

Captain Lono having a friendly chat with the men who will take over for the U. S. Lines, Captain L. B. Adams and B. J. Hickey. At the right, Monroe Jackson, U. S. M. C. electrical inspection coordinator, looks on while Tom Edwards, marine radio-gyro electrician for Western Pipe and Steel, checks compass

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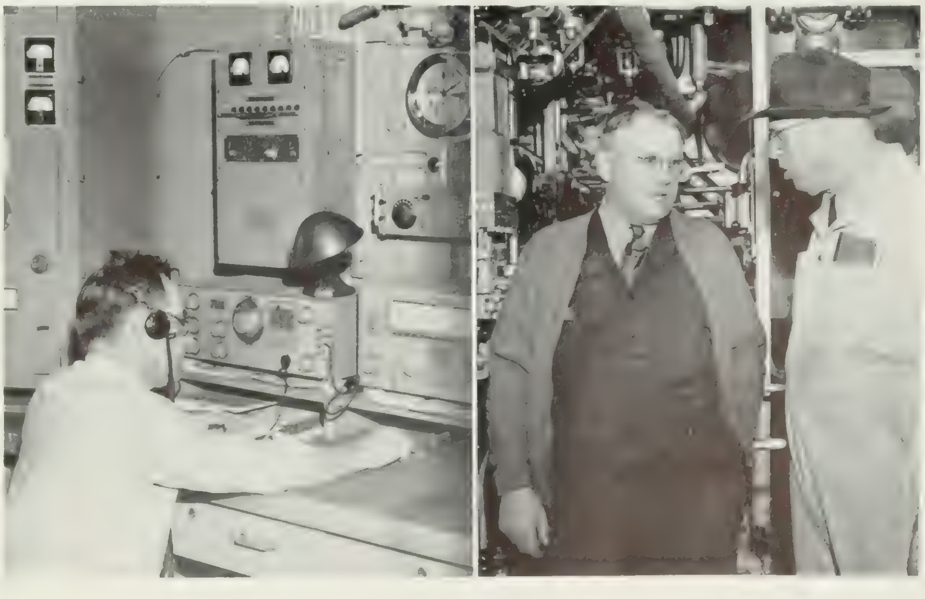
Below: T. J. Cerco has the radio room under control; and B. A. Wilson, superintending engineer, U. S. Lines, is conferring with J. Callaghan, chief engineer



Facing page, at top: C. H. Nunes, second assistant; J. Smith, U. S. M. C. inspector; Swan Bylander, first assistant; Wallace Burnham, third assistant, are getting their first feel of the ship. John Lindberg, Western Pipe and Steel, is working with Foster Wheeler equipment. At bottom: Joel Moor, Busch-Sulzer guarantee engineer, at the controls. W. P. Manuel, U. S. M. C. principal machine inspector, is watching operations with H. J. Peila of Busch-Sulzer

The San Francisco Conference

Abstracts of Some of the More Notable Addresses of the 15th Annual American Merchant Marine Conference October 21-24, 1941

HITLER AND OUR MERCHANT MARINE

by Capt. H. L. Vickery

Whoever is connected with shipping today is too close to the battlefront to be complacent. As an industry, shipping has a double stake in the outcome of the war. As American citizens, we are defending ourselves against a threat to our free existence. As an industry, shipping is fighting for its livelihood. If Hitler beats Britain and Russia, his first move against the United States will be a blitz against American foreign trade. If we do not destroy Hitler, he will do worse than sink our merchant marine—he will lay it up.

Most of you are building and operating the ships that will determine the outcome. My job is to sit in Washington and worry over the progress reports. In some respects, it is the grimmest job any man ever had. It gives you a feeling like holding a hand grenade after removing the pin. I look at the reports for September, showing a progress of only 3% for the month on Hull No. 1000, 2% on Hull No. 1001, 1% on Hull No. 1002, and so on down the entire list of yards and ships. And I pace the floor in anguish and frustration, wondering whether at the rate we are consuming time there can possibly be enough left to meet Hitler's next blow.

After each assault Hitler pauses. After Poland, he waited six months. After France, he waited eleven months. After Russia, how many months will he wait? And during each of Hitler's pauses, America seems to settle back comfortably to do a little more daydreaming, confident that there is plenty of time—that Germany cannot keep it up forever. Yes, if Hitler waits long enough, American ingenuity and her vast resources are bound to catch up with him—provided he chooses to wait.

> SUNK OR LAID UP?
>
> In the Gold Room of Hotel Fairmont, San Francisco, on Thursday, October 23, over 500 men—shipping and allied industry men—men from all parts of the United States—met together in the National Maritime Conference to consider gravely the problem confronting their marine business—listened with rapt attention to Captain Vickery as he spoke these words of challenge and warning: *"If we do not destroy Hitler, he will do worse than sink our merchant marine he will lay it up."*

American industry cannot afford to indulge in the luxury of daydreaming, least of all the shipping industry. Ships are soldiers, and if we cannot win with the ships, we may possibly have to send the soldiers themselves. And God help us, we may even have to send both, though none of us want a shooting war, least of all those of us who were in the last one.

It is silly to go on being complacent while the sands run out. This meeting was called because the builders and operators of ships, and the public officials responsible for maintaining a merchant marine, believe that the time has arrived *to look beyond the ends of our noses.* As chairman, and charged with the responsibility of establishing the morale and tone of this meeting, I hate to be a spoil-sport, but unless we bring ourselves to face the grim complications of the war, we may find ourselves facing prospects even more grim later on.

Shipping is very close to the war. As far as *we* are concerned, the shooting has already started. And what shipping means in this war keeps most of us awake at nights. A panel of experts has been gathered to discuss the war problems with you, and at you, so I shall not attempt to do what these others can do so much better. However, to discharge my responsibility properly, I would like to raise a few questions which seem to me to be pertinent to the general inquiry.

First. Is the shipping industry padding its share of the national expense account? There is much criticism of rates in some trades, and unless the industry takes a good grip on itself in such matters, I believe that general requisition is inevitable. The commission has endeavored to set maximum time charter rates, but cannot hope to provide an answer to each individual rate question without undertaking a more extensive inspection and control than any of us want.

Second. What is going to happen to those who have bought expensive modern ships when the war is over? I think it hardly safe to assume that our fast, modern C-type vessels and tankers are going to be sold for $5.00 a ton when the war is over, or that the commission is going to turn cheap tonnage of any kind loose on the market. The commission will use every means in its power to protect the huge investment that has gone into the new ships. If any of you are thinking of new ships, you might do well to put aside something for them while you can.

Third. To what extent are tax exemptions and subsidies necessary while this war lasts? These aids were necessary during the depression, but the need for them now should be restudied in the light of existing conditions. With the seven lean years past, it is very shortsighted to strive for tax exemptions and subsidies which cannot be clearly justified today. The public will not take kindly to such proposals when *it* is being asked to make personal sacrifices for national defense.

Fourth. What is to be our share of the world's shipping after the war? When the war ends, we will control nearly all of the merchant shipping in the world and should be in a position to secure a just share of the world trade. While no one expects altruism among shipping men, there will be an opportunity to achieve stability for a period of a few years at least if our maritime rivals are willing to do business. What sort of agreements do we want and how are we going to get them?

Fifth. What about the slump that is going to occur after the war? This is our opportunity, and we may not have another, to plan for the men and ships that will not be needed on the regular trade routes when this emergency ends. We have designed the finest ships afloat, suitable for every kind of trade. It is an infinitely harder task to design a plan for keeping the men who have built and who run these ships employed, come the day when the war will be over, and "the little cargo boats, they've got to load or die." However, difficult it may be to draw this plan, it is the principal job which *you of the industry*, and *we of the Maritime Commission* will have to do. We might as well start to work on it *now*.

Capt. Howard L. Vickery, U. S. Maritime Commissioner, was chairman of the principal session of the Maritime Conference and set a challenging note in his opening remarks

Under the present program, the Navy has kept to an absolute minimum the number of charter-party arrangements. To date, it has entered into 15 time charters, 14 bare-boat charters, and one voyage charter. In a number of these instances, it is now endeavoring to acquire complete ownership. In the majority of cases, extensive conversion is necessary. The cost of this conversion is the same as under purchase charter. Under charter, the Government is required to reconvert the vessels. The cost of reconversion, added to the cost of charter, may exceed the cost of outright acquisition, especially if the charter-party is carried on for any length of time.

Future Navy Needs

We know how many destroyers can be serviced by one destroyer tender, and similarly for the other types of combatant vessels. In this way, an estimate can be made of how many such vessels will be necessary to retain for regular peace-time naval service.

Such an estimate does not take into account an additional expansion of the Navy's combatant strength, which the future may bring to pass. We do know that we now have a proposed new program for 400 small ships—mine sweepers, mine layers, sub-chasers, and the like, many of which will have to be obtained by acquisition from those vessels already built and privately owned.

Navy Auxiliaries Their Future Employment

by Rear Admiral Alexander H. Van Keuren

In the past eighteen months, the Navy has taken over from all sources, including transfers from the Army Transport Service, approximately 300 vessels. Considering only vessels of over 1000 gross tons, this total includes about 100 passenger, passenger-cargo, and cargo type vessels, as well as tankers, which have been drawn from the merchant marine. The gross tonnage of these vessels comes to approximately 11 per cent of the 8,134,890 gross tons of vessels of over 1000 gross tons, which represented the strength of the "normal" merchant marine on June 30, 1939—the last date on which such a calculation was made.

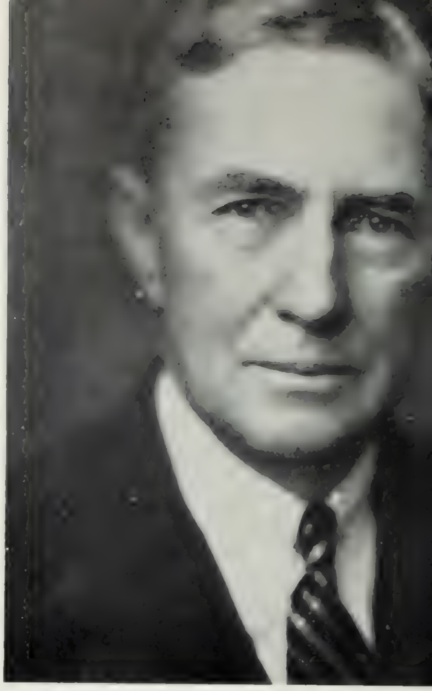
In the period from April 6, 1917, to November 1, 1918, the Navy took over somewhat in excess of 1400 vessels from all sources, including 490 cargo vessels utilized in the Naval Overseas Transportation Service.

It is going to be necessary for us to retain a number of transports, and lighters and cargo-carrying vessels for use in connection with the new and far-flung naval and air bases.

Future Commercial Needs

The man who by position is best fitted to know—the Chairman of the Maritime Commission—has told us that the standard design C-type cargo ships and tankers which the Commission is now building "will meet every demand for speed, efficiency and economy in operation," and "will fill the nation's foreign trade needs, no matter how much expanded, for at least two decades." Even the "Liberty Ships" may prove to be of great utility in post-war world commerce. Of course, no one can tell how many of the merchant ships now being built to suffocate the menace of the Nazi submarine will succeed in escaping that menace.

It may well be that the difficulty which the future holds for us will turn out to be too many commercial ships rather than too few. It may turn out that the greatest contribution which the Navy may then be able to render the American merchant marine will be to keep in its own service, or at least out of commercial activity, those older vessels which it may have taken over for conversion to naval use.



H. GERRISH SMITH
President, National Council of American Shipbuilders

Shipbuilding Today and Tomorrow

by H. Gerrish Smith

On October 1 of this year, there were under construction in the private shipyards of the United States approximately 775 seagoing merchant vessels to the value of unfinished work of about $1,383,000,000, equivalent to 6,900,000 deadweight tons at $200 a ton; and 503 combatant naval vessels and seagoing auxiliaries to the value of unfinished work of $2,900,000,000, or, on a basis of $200 a ton, equivalent to 14,500,000 tons of merchant ship construction. The grand total of unfinished contracts for seagoing tonnage of merchant vessels and combatant naval vessels and auxiliaries on October 1, 1941, is, therefore, equivalent to 21,400,000 deadweight tons of merchant tonnage; and these figures take no account of 418 additional vessels of over 4,000,000 deadweight tonnage now in contemplation, nor of the great number of small commercial craft such as barges, tugs and ferry boats, and several hundred small auxiliary naval vessels, such as mine sweepers, high speed torpedo boats, submarine chasers and many other types under construction, as well as some tonnage for other government departments.

Ship Repairing

Need for ships can be filled also by keeping existing vessels in operation with as little lost time as possible for repair or conversion. The private ship-repairing yards are repairing and reconditioning not only United States commercial vessels, but in addition great numbers of vessels of various classes owned by the Allies, and the sizable fleet of foreign vessels that were tied up in American ports that have been taken over by authority of Public Law No. 101 of June 6, 1941. Furthermore ship repairers have been called upon to make extensive alterations on vessels for the Navy Department, War Department and other Government services.

Employment

Employment in the private shipyards and ship-repairing yards of the United States as of October 1, 1941, was approximately 230,000. A survey by the Bureau of Labor Statistics, Department of Labor, dated April 19, 1941, estimates the peak of employment in the private industry to be somewhat in excess of 400,000 by September of 1942, or an employment total about twenty per cent greater than the maximum reached at any time during the first World War period. The above estimates of the Department of Labor do not take into account such men as may be required by virtue of additional contracts placed since April 19 of this year, nor do they include labor requirements in Government Navy Yards, estimated to be 154,000 by September, 1942.

Shipbuilding Labor Stabilization

Group meetings between Industry and Labor with representatives of the Government participating, were held during the first half of 1941; first on the Pacific Coast, then on the Atlantic Coast, the Great Lakes and the Gulf, which finally resulted in agreements approved by the Government and accepted by Industry and Labor covering a standard first-class mechanic's rate in each district. The agreements also contained provisions for adjustments for increase in cost of living, for overtime and shift work, a no-strike-and-no-lockout clause, machinery for adjustment of grievances and some other safeguards.

Earnings

The average weekly earnings in the Industry, as reported by the Bureau of Labor Statistics, Department of Labor, for July 1941, were $44.59 per week of 44.3 hours work as compared with an earning of $34.03 a week of 39.3 hours work in July 1940. The stabilization agreements have resulted in an increased labor rate of about fifteen per cent, and will add about $320,000,000 to the cost of the shipbuilding program uncompleted in the private shipyards as of October 1st.

It is too early to predict the full effect of these stabilization agreements, but to date, they have not prevented strikes.

Working Hours

In general, the Industry is working forty-eight hours a week, paying overtime after forty hours. Second and third shifts are being worked wherever practicable. A recent report from the Bureau of Labor Statistics, Department of Labor, indicates that in March 1941, fifty-nine yards, employing 112,000 persons, were working about one-fourth of their employees on either a second or a third shift.

Facilities

At the present time, 52 private shipyards are engaged in the construction of seagoing merchant vessels, combatant naval vessels or large-size naval auxiliaries, while additional yards are engaged in the construction of both merchant and Government vessels of the smaller types. On January 1, 1940, before the emergency program started, only 21 shipyards were engaged in the construction of seagoing vessels.

The total approximate expenditure made or projected in furtherance of the present shipbuilding program to cover additional facilities in private shipyards, ship-repair yards, Government Navy yards, and allied marine industries is about $800,000,000, of which about forty per cent was expended in industries allied to shipbuilding.

The number of shipbuilding ways has been greatly increased. At the end of 1939, there were 83 existing ways, each 300 feet or more in length, suitable for the building of seagoing vessels. The number at the present time completed or authorized is 339.

Material Deliveries

The delivery of materials has become the most important factor controlling progress. It is always a factor in ship construction, but becomes of particular importance in the emergency program where the non-delivery of needed material and equipment will seriously disarrange the shipbuilder's construction plans. An important responsibility rests with the Priorities Division of the Office of Production Management to see that priorities are adhered to and that deliveries are made in the order needed.

Admiral Land has given for the industry prospective deliveries as follows:

To the end of 1941, 3 ships a week
The first quarter of 1942, 90 vessels
The second quarter, 146 vessels
The third quarter, 154 vessels
The fourth quarter, 184 vessels
Total for 1942, 574 vessels.

According to my estimates, this program is about 100 ships in excess of scheduled deliveries for 1942, but the Admiral can be sure that the shipbuilding industry will do its best to meet his challenge.

The Admiral's estimate for 1943 is 6,500,000 deadweight tons.

The shipbuilding program of commercial and naval vessels equivalent to 21,400,000 deadweight tons of uncompleted contracts as of October 1, 1941, is equivalent to about 30 per cent of the entire world tonnage of commercial vessels of all types, each of 100 gross tons or over, in existence at the outbreak of the present war—a staggering figure, requiring a supreme effort by American industry to meet desired deliveries.

The Future

Shipbuilding is an old established industry and an important factor at all times to our national security, and its preservation after this emergency is over is vital. The shipbuilder is under no illusions, however, as to the aftermath of his present activity. When the emergency is over, it is probable that most of the work on emergency ships will promptly cease. The long-range program of ships then building can be expected to carry on, but with only such additions to the program from time to time as can be absorbed in our foreign or domestic trade services.

There will be activity in the building of naval vessels until the National Defense Program is completed — a possible five years. Thereafter its volume is expected to be small.

The shipbuilder contemplates little, if any, building for foreign nations. The higher cost of ships in the United States is too great an obstacle.

The shipbuilder must look for his work to the following sources:

(1) Government demand for naval or other vessels;
(2) Commercial vessels for operation in foreign trade;
(3) Commercial vessels for operation in the domestic trade.

In none of these categories can the shipbuilder see very much of hope for a stable business after the emergency is over.

Shipping Industry and the Government

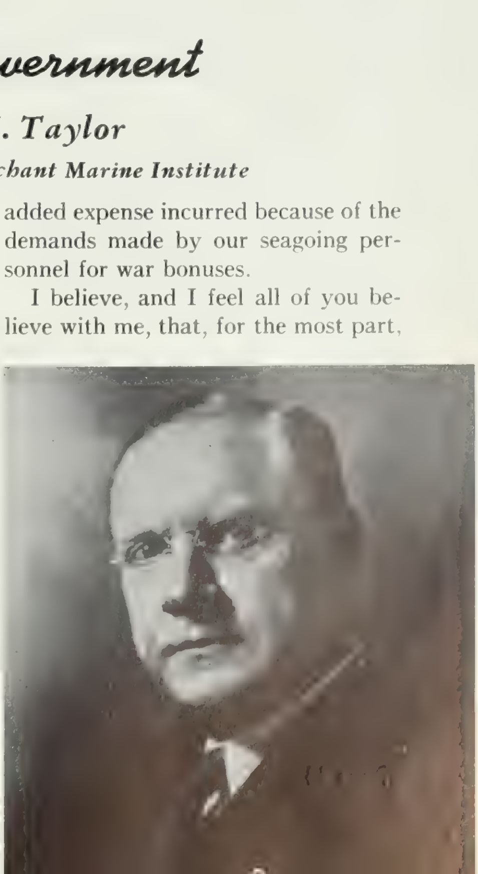
by Frank J. Taylor

President, American Merchant Marine Institute

The voluntary cooperation in national defense extended by American shipowners has not been without sacrifices. Through accepting low-rate cargoes necessary to the defense plans, many operators had to reject freight paying higher rates. There has been placed in operation by the Maritime Commission a scale of maximum charter rates, and freight rates are also subjected to Government regulation, thereby placing a definite ceiling on the earnings of American ships.

A problem which has become increasingly serious to ship operators has been the constantly mounting cost of operations due to rising prices for equipment and supplies—and without doubt the most serious of all, the added expense incurred because of the demands made by our seagoing personnel for war bonuses.

I believe, and I feel all of you believe with me, that, for the most part,



our maritime personnel is rapidly realizing the necessity for the closest cooperation between the shipowner and the men who operate his ships. I am confident that the teamwork that is vitally essential, not only to our industry, but to the nation itself, will be achieved.

For some years past the American Merchant Marine Institute has been making every effort to have enacted into law a bill which would give to unsubsidized foreign and domestic American steamship operators substantially the same exemption from taxation as is provided subsidized operators. This tax exemption applies to earnings deposited in a construction reserve fund subject to the control of the Maritime Commission, to be devoted to new vessel construction.

Unsubsidized lines engaged in foreign trade and those lines engaged in the coastwise and intercoastal trades, compose approximately two-thirds of our merchant marine.

The present system of taxation makes the replacement of vessels by unsubsidized operators practically impossible. The steamship business is uncertain and financially hazardous. Witness the plight of our coastwise lines for the past decade or more. Because of this cyclical business, prudent management requires that the profits of the good years be retained to meet the losses of the bad years, and that a reserve be set aside out of profitable operation to provide for the replacement of obsolete tonnage.

The system proposed was contained in Section 23 of the Merchant Marine Act, 1920, which granted certain steamship operators, an exemption from war profits and excess profits tax and exempted the proceeds of the sale of vessels from taxation, if such proceeds were devoted to new construction. Unfortunately these provisions have either been superseded by the 1936 Act, repealed, or have expired by limitation. It is pertinent to note, however, that due in substantial part to the inducements of the tax exemptions contained in the Act of 1920, vessels costing some $130,000,000 were constructed.

The purpose of this needed legislation is clearly in line with the expressed policy of the Congress to encourage the replacement of worn-out tonnage. It affords non-subsidized operators the same inducements to accumulate funds for new vessel construction which have been granted to subsidized operators.

The needs and expectations of the shipping industry from the Government are merely that the Government at all times remember and bear in mind the importance of the shipping industry in some similar magnitude as currently is apparent to every one.

The goal which we in the industry have consistently striven for is not only an adequate American merchant marine, but a merchant marine without peer in the maritime nations of the world. Toward that goal the Propeller Club of the United States and similar organizations have performed commendable service. Let us continue our efforts toward an American Merchant Marine second to none.

Public Interest In Shipping Securities

by R. Earle Anderson

R. Earle Anderson, Director of Finance, U. S. Maritime Commission

First, let me suggest the importance of taking the public into your confidence with respect to the financial affairs of your companies by means of frequent, clear and frank financial reports.

In order that such reports may be useful, they should all talk the same language; that is to say, the form of the reports should have a more or less common pattern, and back of them should be a uniformity of accounting method that will make for confidence and understanding.

Of hardly less importance than the use of accepted and reasonably uniform methods of accounting is the simplification of the corporate structure. Not only in the shipping industry, but in corporate practice generally, simplification is the order of the day. In a number of instances, notable progress has recently been made in this respect or is in process of accomplishment.

A most important step that has been taken by some companies and might well be taken by others is the establishment of a conservative and stable dividend policy. For many companies a dividend policy has until very recently been an academic matter; there have been no dividends possible. But with the present great increase in earnings, all that is changed. Whether the future will permit the indefinite continuance of dividend payments cannot, of course, be predicted. But at least a modest dividend policy that recognizes the cyclical nature of the business and tends toward stabilizing it from the investor's standpoint would appear to be the part of long-range wisdom.

The temptation to cut melons may be very great, but the prospect of a melon feast holds more attraction for the speculator than for the permanent investor. The present period of large earnings might better be taken advantage of to build adequate cash reserves. The statute requires of subsidized operators both a conservative dividend policy and the building of substantial reserves. I suggest that even the subsidized operators might well disburse less than the statutory ten per cent, and thus, while recognizing the importance of distributing part of their present earnings on a regularized basis, plow back the balance into the business as a protection against the rainy day.

Closely related to this matter of dividends is that of debt reduction. The desirability from every standpoint of utilizing the proceeds of present operations to reduce funded debt need hardly be stressed. But I suggest that here, as with dividends, a carefully developed policy is highly important. If free earnings over and above dividend requirements can be used to pay off ship mortgages, it goes without saying that the result will be beneficial, a stronger financial picture will be produced, and public confidence will be invited. But the need for maintaining a consistent and reasonably constant building program, and of making adequate financial provision for such a building program must not be overlooked. Neither should there be overlooked the importance of coming into the hollow of the shipping cycle with ample cash for the tiding over of losses. It is not easy for a company to borrow money for continuing regular dividend payments or to make up operating deficits during a period of depression in its business, no matter how successful it may have been in clearing its balance sheet of funded debt.

I wish to make one final suggestion that might do much to acquaint the public with shipping securities and with the shipping business generally. It is this: That a plan be worked out whereby mortgage notes held by the Commission and representing purchase money on ships acquired from the Commission or built under the provisions of the Merchant Marine Act would be offered to the public, perhaps with a guarantee as to principal somewhat along the line of the ship-mortgage guarantee plan embodied in Title XI of the Act. Such an arrangement would, of course, require legislation. The details would have to include arrangements for trusteeing the mortgages and mortgage notes, perhaps with the Commission as trustee, and the issuance of participating certificates related either to specific mortgages or to a group of mortgages, or even to the entire portfolio of mortgages. It is clear I think that such securities, carrying a Government guarantee, would have a wide and favorable market, probably with some interest differential running in favor of the Government. While in a sense such notes would be Government securities, they would be so closely related to the shipping industry that their wide distribution would be advantageous.

Educating the Public

by Mark O'Dea

Director of Information, U. S. M. C.

It is the well-measured opinion of analysts of trends of public thinking that "Liberty Fleet Day" was a big step in revival of patriotic interest in our merchant marine. That is something it must have if its complete revitalization is to be accomplished and its post-war commercial status established on a high and successful level.

Two lessons are to be learned from "Liberty Fleet Day." *First,* there is no need for us to take the position that the present emergency will nullify the effort we have made up to this time to promote the American merchant marine.

Second, that it is just as feasible for the merchant shipping industry of the nation to cooperatively promote events of country-wide scope that will win the interest of Americans, as it is for any other of the great industries to do it. Many of them have done a fine job in public relations, as witness the railroads through their association campaign.

It is apparent that this emergency, which is making all of our people's minds more receptive for education in our nation's business, provides a golden opportunity for us to continue, so far as possible, the travel-and-ship-on-American-ships campaign, with the accumulative benefits to be reaped in post-war days.

We must follow the democratic way, which is educational, as opposed to the totalitarian path, which is propaganda. Education is for open minds. Propaganda is for closed minds.

There is only one path for us to take —and it is the path of reason. Ours is an appeal to common sense and we can depend upon the eternal common sense of the American people.

Hawaii U. S. A. She Should Be a State

by Earl M. Thacker

President, Propeller Club, Port of Honolulu

Hawaii is one of America's greatest naval, military and commercial assets today.

Hawaii means much to the mainland. Army and Navy men—the War and Navy Departments know its tremendous strategic value, its critical importance in the defense of the continental United States and in the maintenance of the freedom of Pacific seas.

Shipping men who have made even a cursory study realize the present value of Hawaiian commerce to the American merchant marine, and the expansion that one has every reason to expect.

With a war-torn and impoverished Europe, Hawaii can expect an ever-increasing tourist trade, for with incomparable scenic beauty, and the eternal lure of surf, palms, and blue seas, there is everything most compelling about those sunny isles in the Pacific.

Hawaii contends that she is ripe and ready to be taken into that magnificent sisterhood that constitutes the States of the Union. She awaits that action, which she considers her due, calm and patient, with complete assurance to the consummation of that destiny, which the events of a developing world have assigned to her. Hawaii pledges herself to play to the utmost whatever role, gay or tragic, the cycling years of the future may assign her, as meantime she keeps constant vigil, as America's outpost to the West.

Abstract of address before American Maritime Conference, San Francisco, October 24, 1941.

News FROM THE PACIFIC NORTHWEST

by Daniel L. Pratt

Shipyards Maintaining Fast Pace

The **Tacoma** plant of the **Seattle-Tacoma Shipbuilding Corp.** continues to lead the parade in the Pacific Northwest in its record of keel layings, launchings and deliveries. The first of the C-3 types, of which this yard has contracted to build 36 for the Maritime Commission, was launched as an army transport, the **Frederick Funston,** on September 27, and a second was launched October 14, the **Steel Architect,** for the Isthmian Steamship Co. Deliveries of ships will be fairly regular events from now on, as the greatest possible force of men is being worked night and day. **Plant No. 2,** at Seattle, with its large contract from the Navy for destroyers, has a busy force at work fabricating parts but, with the exception of one keel laid, the erecting of these vessels has not yet gotten under way.

One vessel that is finished and ready to launch in the near future is the new Coast and Geodetic Survey vessel, the **Pathfinder.** She has been built at the **Lake Washington Shipyards** at Houghton from plans by W. C. Nickum & sons, and is 220 feet in length with diesel power. In design she is similar to the Explorer, built two years ago by the same yard and from the same designer's boards. The Lake Washington yard has laid three keels on its contract for six mine sweepers.

At the **Associated Shipbuilding** yard on Harbor Island, the seaplane tender program has gotten well under way with two keels already laid. The **Lake Union** plant, with a contract for six mine sweepers, has two keels laid.

Winslow Marine Railway on Bainbridge Island has its plant expansion program well completed and is only waiting for material to proceed on its mine sweepers.

Meanwhile, the wood shipbuilders, such as Bellingham Marine Ways, Kruse & Banks, Seattle Shipbuilding Co., and others, not being so affected by shortage of material, are making good progress on wooden hull contracts.

Sitka Blast Being Investigated

Following the disastrous explosion at the Navy's new seaplane base at Sitka, Alaska, a Navy investigator, Lieut. Commander W. Sihler, and representatives of contractors, headed north to study the magazine blast which killed 6 men there October 12. At the time this is written, nothing has been issued in an official way to indicate that the disaster was the result of sabotage. Damage inside the air station, a five-million dollar Alaska defense project, was not indicated, but it is understood that the force of the explosion broke windows over three miles away.

New Cutter for Coast Guard Service

The 125-foot patrol boat **Ewing,** which was scheduled to arrive on Puget Sound about November 1 for the Coast Guard, is a new type of cutter, capable of duty as a lightship and buoy tender as well as for rescue work at sea, according to Capt. W. H. Munter, commander of the Seattle district. She was prepared for her duty at the Coast Guard yards at Baltimore, Md., and part of her new equipment will include a derrick for handling buoys. She will assist the cutter **Fir** in buoy work along the Washington coast, and will also call at lightships every three weeks with relief men, giving crews of such boats more frequent shore leave.

Cargo space for Alaska shipments is at such a premium that barge loads of cargo are being towed north from Seattle. The barge shown here is loaded with contractor's equipment

One of the new 47-foot "Crash Boats" just completed for the U. S. Navy by N. J. Blanchard Boat Co. of Seattle

Army To Purchase Salmon in Alaska

Having a considerable effect on the usual ship movement of salmon from the Alaska canneries to Seattle was an order issued recently that canned Alaska salmon destined for soldiers in the North be purchased by the Army direct from the canneries. The announcement was made by Governor Ernest Gruening, who said he had been notified by Maj. Gen. Simon Buckner that permission had been granted to make such purchases direct. This will eliminate carrying the salmon to Seattle for inspection and then back up North for consumption, which will aid greatly in easing the shipping stringency.

More Vessels To Government

The movement of West Coast merchant vessels into the service of the armed forces was speeded up again the past month when it was announced that the **Clevedon** and **American Star** will go into Army service shortly. American Star is operated by the Red Salmon Canning Co. of San Francisco and would normally have been tied up this fall at the end of the salmon season. Clevedon was formerly the Italian vessel Feltre, salvaged after going aground on the Columbia River bar a few years ago. She was operated for a time by the Pacific American Fisheries and more recently by the Alaska Steamship Co. Entering the Navy service soon will be the **Boxer,** which until recently has been the supply ship of the U. S. Bureau of Indian Affairs. She will now be used in the national defense service out of Dutch Harbor. She was at one time a training ship for the Naval Academy at Annapolis. With the arrival of the **Coast Miller** October 17, Seattle saw the last of the regular Coastwise Line freighters in port for a time, as the fleet of six has been requisitioned by the Government for special voyages to Manila out of California. The Coastwise Line is the Puget Sound agency for the Pacific Republics Line.

Army Buying More Fishing Boats

Between 35 and 40 seine boats and similar small craft from Seattle and other coast ports are being recruited for auxiliary service for the Army in Alaska. For several weeks a special detail of the Quartermaster Corps, operating out of the depot at Seattle, has inspected vessels suitable for this work and a number of purchases are pending. Before entering their new service, they will be rehabilitated, which will give a considerable volume of work to the wood shipbuilders on the Sound. In Army parlance, these vessels are known as "distribution box boats" and are used largely by the Coast Artillery to service mine fields, and for carrying supplies to remote posts, a service to which, on account of their stable construction and seaworthiness, they are well adapted.

Wooden Ship Program Urged in British Columbia

Arthur Mercier of New Westminster and **Gilbert Jukes** of Coal Harbor, spokesmen for about seventy-five boat builders interested in the scheme, have been in Ottawa to submit the offers of the builders to construct for the Canadian Government 150 to 200 seagoing wooden cargo ships to help relieve the shipping shortage. The shipbuilding group's plan is to build wooden cargo ships of 3000 deadweight tons to supplement Canada's already large steel ship program. The ships would be an all-British Columbia product, using diesel engines and auxiliary parts built in the province as much as possible. Yards building them would be mostly those on Burrard Inlet, Coal Harbor, False Creek and the Fraser River.

Immense Plant For Marine Shaftings

An immense plant, devoted to the manufacture of heavy shaftings for destroyers and cargo ships, was announced recently by **Harry W. Smith,** vice president of the **Isaacson Iron Works.** Location will be on the Duwamish Waterway next to Boeing Airplane plant No. 2, and initial expenditure will be $2,600,000, probably to be expanded to $3,500,000 later. Production may begin about January 1, although the plan will not be wholly completed till about April. The new plant will supplement or coordinate with the present large Isaacson Iron Works plant on South Alaskan Way, and it is stated that with the new facilities added, Isaacson will have the largest plants producing forgings in the West. Fifteen acres of ground has been set aside for the new project, with buildings that will cover over 4 acres to start.

10,000-Ton Ship Launched in B. C.

Largest ship built in British Columbia in many years, the ten-thousand-ton freighter **Fort James**, slid off the ways October 15 at the Burrard Iron Works' North Shore Yard, Vancouver, B. C. She was the second freighter of her size to be launched in Canada in a week, the first one being launched in Montreal. She was sponsored by **Mrs. W. C. Woodward,** wife of Lieut. Gov. Woodward, and **Anne England,** nine-year-old British evacuee. Three thousand people witnessed the launching ceremonies which were broadcast over a national network. As the ship slid down the ways, factory whistles blared the "V for Victory" signals.

Rush For Lumber Space

Following the announcement of the **Maritime Commission** that there would be no priorities on lumber to be moved eastbound during the month of November, with space for thirty million feet available, there has been a lively scramble to book the space by shippers anxious to supply long-delayed customers in the east. All of the lines in the past few months have been obliged to curtail service in number of boats and this extra opportunity to get lumber through comes as a dispensation to both shippers and customers at the other end.

Lost Seamen Given Honors

Sailormen who lost their lives when the Seattle-built ship **Libby-Maine** was sunk in a Caribbean Sea hurricane in September were honored at Seattle recently when the yacht **Lillian D. Foss,** banked with flowers, carried the widows and orphans of those living in Seattle to a point off West Point where wreathes of flowers were scattered on the waters in memory of those whose bodies were not recovered. Casting the first wreath was **Mrs. Bierd,** widow of **Capt. Hans Bierd,** master of the vessel, who was swept from the bridge in the storm, together with his mate, **Harold Christenson.** Capt. Bierd was a well-known mariner along the coast for many years, and had the distinction of commanding the first vessel, the **Roosevelt,** that passed from Puget Sound into Lake Washington when the canal was formally opened.

Big Halibut Catch Out of Seattle

The **Fishing Vessel Owners' Association** at Seattle reports a very successful season for the halibut fleets operating out of Seattle. About 190 vessels, operating with about 1800 fishermen, landed approximately 18,399,000 pounds of fish, valued at $2,197,000. The fleet made 815 vessel trips, and the average price was good, running about 11.94 cents per pound. Last year, on about the same catch with more trips, the income was $200,000 lower, owing to a lower average in price.

Marine Shorts

The Seattle district of the **Coast Guard** has sent out notification that weather report broadcasts from Tatoosh Island may be discontinued, beginning with November. It has been the custom for years for the direction finder operated by the Navy Department there to send out local weather findings to ships listening in on the beam. Whether this is to be discontinued because of temporary war conditions, or because of a lack of further need on the part of mariners was not stated, but **Capt. Munter** of the Seattle Coast Guard District has given shipping owners or skippers a chance to write in and express their opinions so he might evaluate the broadcast's worth.

* * *

Whaling boats out of Victoria, B. C., have completed their season's operations and are back in port after their greatest catch in 20 years. The ships operated out of Naden Harbor, Queen Charlotte Islands.

* * *

The Alaska Line is showing a new port on its northern schedules, called Whittier, and considerable speculation has been aroused as to its location and how it sprang into existence. It is interesting to know that in a short time Whittier will be one of the most important calls in the territory. It is to replace Seward as the tidewater terminal of the Alaska Railroad. The new name is already official and the port is growing in importance. It is located in Passage Canal, Prince William Sound.

* * *

Approved works and appropriations include six projects for the State of Washington, as follows: Columbia River at Kennewick, $30,000; Cowlitz, old mouth, $12,000; Port Angeles Harbor, $10,000; Stillaguamish River, $35,000; Keystone Harbor, $225,000; Snake River in Washington, Oregon and Idaho, $31,000,000. There is also said to be an approval of a $49,000,000 dam across the Columbia River at Umatilla.

* * *

Late in September, orders were received by **Columbia River shipyards** which insure a continuation of construction in that district at full speed for some time to come. Navy contracts, totaling $11,760,000, included: **The Commercial Iron Works,** four subchasers at $640,000 each, and four fleet tugs at $1,500,000 each; **The Albina Engine & Machine Works,** five sub-chasers in addition to the four previously allotted.

* * *

The Coast & Geodetic Survey ship **Explorer** sailed from Seattle October 20 "for waters west of Hawaii," according to **Commander A. M. Sobieralski.** After her return, which has no fixed date, she will engage in survey duties in the Strait of Juan de Fuca.... The Air Arm of the Navy is contemplating a half-mile-long seaplane landing area, 500 yards wide and marked by radio control buoys, directly north of Sand Point Station, Lake Washington, to accommodate the enormous military air traffic that is necessary on the lake at the present time. . . . Salvaging operations at the wreck of the Russian freighter **Vazlav Vorovsky,** which ran aground on Peacock Spit at the mouth of the Columbia River six months ago, have ended with approximately half of the cargo recovered. . . . Seattle's Harbor Patrol has purchased from **Jerry Bryant,** local boat dealer, two fast emergency **Chris Craft** speeders. These are of the type known as "Dinette Cruisers," with 120 hp gasoline motors. They will have towbitts installed to enable them to aid in general harbor work. . . . Another sailing schooner that will soon return to service after long idleness is the **John A.,** former Bering Sea codfisher.

Personal Gleanings

Chief Boatswain Mate Harvey Ford of the Coast Guard, accompanied by a crew of five men, left Seattle recently for New York to take on the new 125-foot Coast Guard cutter **Ewing** and bring her back to the West Coast. . . . **Joseph C. Platt** of Edmunds, Wash., was appointed by **Commodore S. A. Perkins,** vice president of the Navy League for the State, as state chairman for Washington's participation in the Navy Day celebration October 22. . . . **Mrs. Walter M. Welles,** wife of the vice president of the Isthmian Steamship Co. of New York, christened the Steel Architect launched by the Maritime Commission at Tacoma October 24. . . . **Capt. William H. Munter,** present commander of the Seattle district of the U. S. Coast Guard, left October 22 for Washington, D. C., where he will serve as president of an examining and selecting board. His stay in Washington will be indefinite and he is replaced by **Commander F. C. Hinsburg,** chief of staff. . . . After 50 years as a master mariner and bar pilot, **Capt. Edward P. Bartlett,** well-known all along the coast, announced his retirement late in September.

News FROM THE PACIFIC SOUTHWEST

by K. M. Walker

Los Angeles Shipyards

The "big four" steel shipbuilding yards on Los Angeles and Long Beach harbors are very busy these days in an all-out national defense effort to finish as promptly as possible their tremendous program of construction for the U. S. Navy and the U. S. Maritime Commission.

At the **Consolidated Steel Corp.** Long Beach plant, a keel was laid September 18 for a big Navy transport, and on October 15 keel for another of the same type. These will be named, respectively, U. S. S. Doyen and U. S. S. Feland. Consolidated is building a new shipyard on Los Angeles' inner harbor, and, by the time this appears in print, will probably have laid there the first keels of a program of four C-1-B type steamers, for which they were awarded a contract on June 9, and of a program of 26 C-1-B type steamers, contracted for as of September. The completion of these programs will keep Consolidated busy at its shipbuilding activities for another two years.

Ralph J. Chandler, vice president, Propeller Club of the United States, was master of ceremonies at Consolidated's Long Beach yard on "Liberty Fleet Day"

California Shipbuilding Corporation is hitting its stride at the big Terminal Island yard and is launching and laying keels with almost clock-like regularity. Out of a program of 55 identical vessels, their first EC-2 type steamer, the John C. Fremont, slid down the ways on "Liberty Fleet Day," September 27. On October 16, 23 and 30, they launched Thomas Paine, Benjamin Franklin and John Paul Jones. Schedule delivery for the first ship is February 1, 1942, and for the last ship, March 19, 1943. The yard is seventy-five days ahead of schedule now and, if all goes as estimated, will deliver first ship on November 24, 1941, and the last on October 7, 1942, this last date being 164 calendar days ahead of schedule.

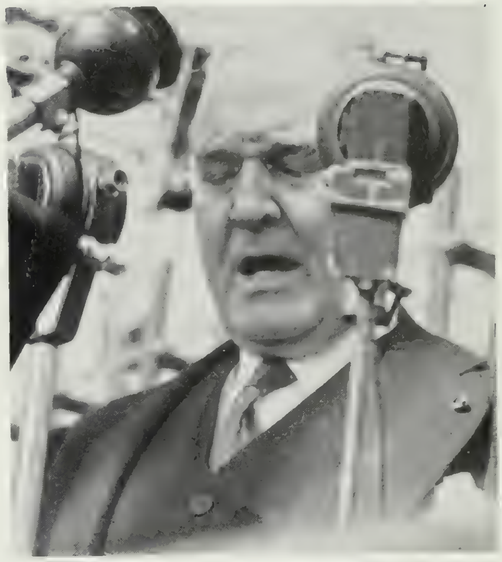
Bethlehem's San Pedro yard, rebuilt for construction of 10 destroyers for U. S. Navy, has keels laid for and is rapidly fabricating and erecting steel for these hulls on four ways.

Los Angeles Shipbuilding and Dry Dock yard at San Pedro has contracts for three big Navy repair ships and three Navy seaplane tenders. Two of the repair ships are now in frame.

Maritime Commission Opens L. A. Office

The Maritime Commission announced that effective November 1 a Los Angeles branch office of its Pacific Coast District would be opened and that Captain James Irvine had been appointed for the Commission at Los Angeles.

The opening of this branch office will facilitate the emergency shipping activities of the Commission in Southern California.



U. S. Maritime Commissioner Captain Edward Macauley broadcast from two Los Angeles Harbor shipyards on "Liberty Fleet Day" September 27

A Captain of the Engineers, United States Army, in charge of technical work at Fort Lewis, Washington, during the last World War period, Captain Irvine has since acquired wide and varied experience in shipping. For two years following the war, he was in charge of conversion of British warships to merchant ships at Southampton and Portsmouth, England. From 1922 to 1926, he was vice president and general manager of the Mexican State Steamship Line which operated passenger and freight ships between San Francisco and Corinto, Mexico. During that period, he supervised salvage operations on two vessels.

From 1927 to 1932, he was associated with the oil industry, returning to shipping in 1933 as vice president and general manager of the Mexican Mail Steamship Company which operated the steamers Sonora and Sinaloa between San Francisco and Mexican Pacific ports. In 1937 he was placed in charge of the Marine Department of Wells Fargo and Company Express at

Mexico City, remaining there until September, 1939, when he became head of the Marine Department of The Petrol Corporation, Los Angeles. He retains this position until his appointment with the Commission becomes effective.

Torrance Steel Plant To Aid Navy

Following instructions from the United States Navy Department, a $2,000,000 expansion project, due for completion before May 1, 1942, was announced recently by The National Supply Company of Torrance, Calif.

On a "letter of intent" from the Navy Department, the steel company will proceed with construction of a larger plant to increase the company's forging press and lathe facilities for the production of shafts for large ships and other finished forgings for the Navy and Maritime Commission.

The addition will consist principally of a 1500-ton press, with the necessary complement of cranes, manipulators, furnaces and soaking pits together with five of the largest-size lathes, all to be housed in a new building 750 feet long, south of the company's present forging plant.

The Torrance plant was among the earliest producers of electric steel and its "Ideal Electric Steel" is shipped to oil fields all over the world.

This plan was established in Torrance in 1911 as the Union Tool Co., of which the late Dr. Jared Sidney Torrance, city founder, was president.

The firm became a subsidiary of The National Supply Co., with headquarters in Toledo, Ohio, about a decade later.

Present valuation of the plant and equipment, occupying 25 acres on Border Avenue and Carson Street, runs into several millions of dollars. Employment, now placed at around 1000, will be increased proportionately with the new expansion.

Navy Base Change At Long Beach

The U. S. Navy on October 1 announced a change in Navy Base administration by the establishment of an operating base in the San Pedro-Long Beach area.

For administrative purposes this operating base will now comprise: the Roosevelt Base on Terminal Island; the Naval Air Station on Terminal Island; the Naval Net Depot at San Pedro; the Navy Hospital, Naval Dispensary and Reserve Aviation Base at Long Beach; and the Disbursing and Transportation Office at San Pedro.

Oil Shipments

Bulk petroleum shipments from Los Angeles Harbor for the week ending October 11 totaled 822,188 barrels, a slight drop under the total for the previous week. Of this total 490,387 barrels were consigned to Pacific domestic ports, 306,801 barrels to Pacific foreign ports and 25,000 barrels to Atlantic foreign ports.

De La Rama Takes Over Agencies

Beginning December 1, the De La Rama Steamship Company will take over the Southern California Williams, Dimond Company's Quaker Line and Pacific-Atlantic Steamship Company agencies. William C. Ricks, formerly San Diego agent for Williams, Dimond, has been appointed Long Beach terminal superintendent for the De La Rama Company, while H. E. Holbrook will continue to handle the vessels at San Diego.

The Williams, Dimond Company, who have been agents for Quaker and Pacific-Atlantic Lines for 16 years, have disposed of their stock interest in the lines following the sale of 10 of the ships within the past year. They will continue as agents for the Osaka Shoshen Kaisha line, the Union Steamship Line of New Zealand and the Mexican Transport Line and as exporters and importers. Williams, Dimond have figured prominently in Pacific Coast shipping for the past eighty years.

The De La Rama Company operates a regular service in the North Atlantic-Far Eastern trade with ships calling at California ports en route. Besides three of their own motorships, they have several Scandinavian ships under charter and have recently been given four vessels of Panamanian register under a long term charter agreement with the U. S. Maritime Commission.

More Shipyards for San Diego Area

Two firms are reported negotiating for sites in San Diego to be used in the construction of concrete oil barges, and a third is seeking space to build the radical "Sea Otter" type of cargo vessel. Each concern desires at least 1000 feet of water frontage, which has created quite a problem for the Port Commission, as a survey reveals that of the original 1100 acres available for industrial development all but 40 acres has been leased and work is being rushed on the numerous canneries, can plants, and warehouses now rising on these sites. Of the 40 acres available, it seems that the single largest area is 25 acres at the foot of Tenth Avenue and which is slated to be used in the construction of a municipally-owned industrial pier. The balance is made up of small plots scattered among the aircraft plants and the shipyards, and none offers the area required for large scale shipyard operation.

Analyzing the situation makes it clear that San Diego has suddenly ceased to be the quiet paradise of the geranium - growing retired business man and has become a bustling seaport with numerous plants, all of a respectable size, about to commence operation, and others seeking to crowd in. A trip along the south side waterfront will reveal to the outsider the immense amount of construction going on. To the native, the impending payrolls, required housing for employees on top of the present unprecedented demand, and the aggravation of the existing impossible traffic problem makes a picture rather difficult to comprehend.

As the water frontage desired by the proposed shipyards is clearly not available in San Diego, the only alternative is to allocate areas in the National City waterfront system to the south, but which do not now have the deep water desired and would require some dredging. This is a problem now receiving the full consideration of the harbor authorities.

Lumber Records Continue To Fall

With the steady parade of loaded lumber schooners entering San Diego Bay continuing unabated, and turnaround being speeded up to meet the heavy demand, new records are being made in lumber delivered onto local docks, wharves, bulkheads and the city boulevards, or anywhere a sling-load can be dropped. To the credit of Joe Brennan, port director, it is apparent that the boulevards fronting the bay are not quite as crowded with piles of lumber as they were a few weeks ago but the problem of what to do with all the incoming material is still a headache to the port staff.

Up to October 1, receipts of lumber by water had reached a new record of 112,500,000 board feet for the year. This is by far the largest for any similar period in the history of the port. The September delivery was 12,658,000 feet, and deliveries for October apparently will considerably exceed this figure and the expected grand total for the year is close to 150,000,000 feet.

Gypsum Assuming Importance

From the gypsum plant in Plaster City, in the heart of the Imperial Valley, a train of 100 freight cars recently arrived in San Diego via the San Diego & Arizona Eastern Railway and was stored on the north side of Pier 1 at the foot of "B" Street, San Diego, awaiting shipment to the Philippines.

This commodity has been assuming more importance lately as an export item and of these items this Southern California port has been notoriously shy. It has been a case of everything coming in and nothing going out. Gypsum is being handled in Philippine bottoms, and the steamers Sagoland and Don Jose were recent callers and took part cargoes of this material.

May Resume Towing Log Rafts

Mr. Harry Whittemore of the Benson Lumber Company, San Diego, has been in Oregon visiting Columbia River ports, and on his decision regarding the loss and damage to three of their log rafts within a period of a year will rest the fate of these big tows. While sabotage has been hinted as a possible cause of the loss by fire of two of the big rafts while at sea, the loss of the third during heavy weather is not thought to be anything but a peril of the sea. The last raft shipped in 1940 and the first in 1941 were both badly damaged by fire, which in both cases broke out suddenly at sea. The effect of these losses on the insurance rates may prohibit further movement of the nine hundred foot rafts, but the Benson Company, operating the only saw mill in Southern California, face a problem in shipping logs in any other manner. As the rafts contain about 5,000,000 board feet of timber, and are towed down the coast from Kathlamet, Washington, to the mill at San Diego, the Benson Company has found it profitable to operate their large mill.

To haul the logs by rail would be prohibitive. Vessels are not available to handle the solid logs and it would appear that the existence of the mill depends on floating the logs to their destination. If it appears to Mr. Whittemore that the losses by fire were not due to acts of sabotage, and the actual cause is discovered or reasonably assumed, the shipment of logs by raft may continue. A full description of the rafts and the accidents of the past year appeared in this section of the September issue.

Boat Yards

The Campbell Machine Company have finished the job of lengthening the steel electric dredge Alamitos of the Case-American Construction Company and have turned her over to the owners for the finishing touches before she enters service dredging in the lower bay. The Alamitos sank the day before she was to begin dredging a North Island channel when a spud fouled the top of the spud frame during an unusually high tide, and the following ebb caused the stern to hang up with the result that the bow became submerged and flooded all compartments. She was raised the middle of August and taken to the Campbell plant for repairs, and the owners decided to add twenty feet to her length.

Also at the Campbell Machine Works, the 108-foot tuna clipper for Tony Tavares and M. Ferriera is ready for launching and will be put in the water as soon as the ways are cleared of the numerous repair jobs under way. The 128-foot tuna boat for John Vattuone and Sons is well under way but is being delayed by the difficulty in obtaining materials and may be held on the stocks for some time.

The San Diego Marine Construction Company have the tug San Miguel for the Star and Crescent Boat Company, well in frame. Building at a cost of $75,000, and powered with a 460-hp Washington diesel engine, it is reported she will be used in towing a steel oil barge between San Pedro and San Diego to augment the service of the Star and Crescent tanker San Diegan. The steel barge is being built by the Dravo Corporation at Pittsburgh and will be shipped, knocked down, to Stockton and reassembled on the Sacramento. She will then be towed to San Diego for installation of pumping equipment before entering service.

The Martinolich Shipbuilding Company has recently undergone a change in management. Anthony Martinolich, until recently president of the San Diego yard, has gone to San Francisco to take over the operation of their Northern California yard. The management of the San Diego yard will be handled by V. Earl Roberts, of the firm of Hotchkiss and Anewalt, with Charles and John Martinolich handling the yard, and chief machinist Petrich in charge of the shop.

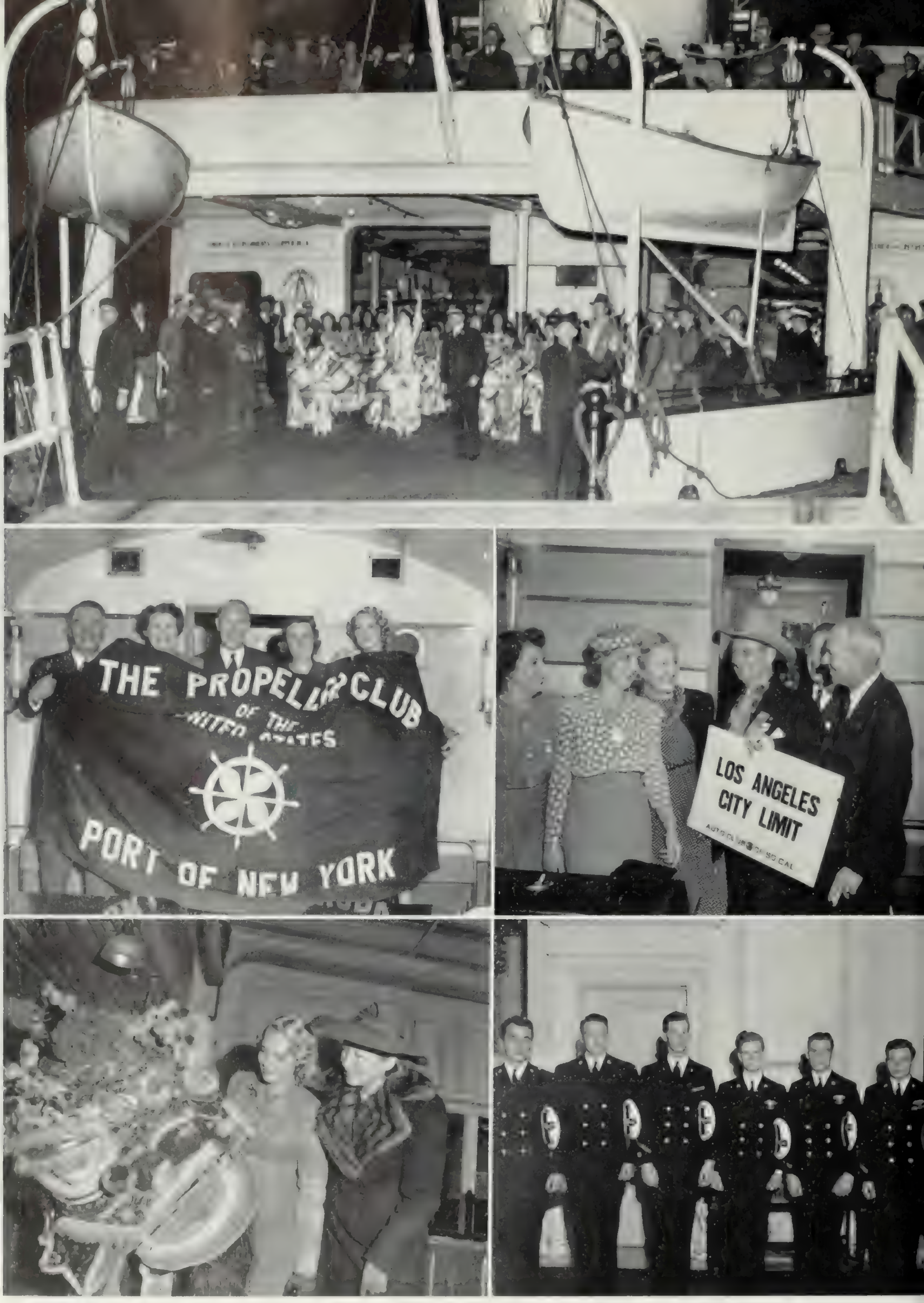
The new Hodgson yard in Long Beach has "gone to town" during the past few weeks and has the new boat Monarch in the water, and the 80-footer Viking on the stocks and developing fast, and in July took over a strip of vacant land on 7th Avenue in Long Beach on the estuary, and now has a very respectable looking shipyard going full blast.

Personal Items

H. C. Godsil, fisheries biologist, has recently completed a survey of Pacific coastal waters on the boat N. B. Scofield in command of Lars Weseth. Mr. Godsil covered 2900 miles of coast from Lower California to Vancouver Island and reports that, while few albacore, the most sought and highly prized of the tuna family, have been brought into San Diego since 1926, the Pacific Coast waters were found to abound in the white meated fish.

Capt. Nels Sinnes docked the Samoa at San Diego, September 19, with the largest cargo ever crammed into the ship. A total of 2,021,000 feet was discharged and the ship returned to Westport, Washington, to load a duplicate cargo.

CONVENTION MEMORIES

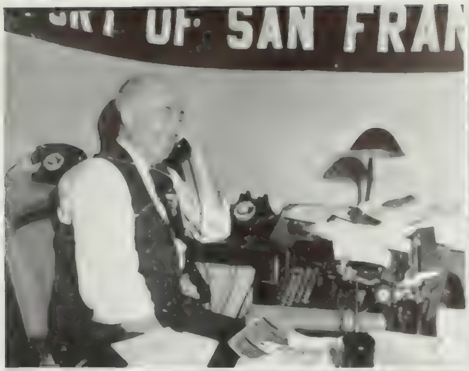


Reception

Confluence of hundreds of Propeller Club-American Merchant Marine Conference delegates brought typical San Francisco welcoming ideas into action . . . including a 40-piece Chinese girl drum corps, the traditional Chinese dragon (see lower left view), a special ferryboat which transported 12 carloads of visitors from Oakland main line to the renowned Ferry Building, and the cadets from Maritime Commission and California training ships. Eddie Macfarlan (left figure in center-left view) headed the welcoming committee which joined the Eastern train up at Sacramento

Distinguished Visitors

Beginning at the top, that's General Chairman Ed Harms placing official registration badge on Rear Admiral Emory S. Land. Center: Robert C. Lee and Mrs. Lee upon arrival from the Land Cruise Special. Right: Thomas G. Plant and Capt. Howard Vickery. Second row: Mark O'Dea (at the telephone). In the larger view . . . John F. Fitzgerald, of Boston Port Authorities, ex-mayor of Boston and father-in-law of Joseph Kennedy, former Ambassador to Britain (left), Admiral Emory S. Land, chairman of the U. S. Maritime Commission, and Vincent H. Olson, Newport Shipbuilding Corp., Los Angeles. Rear Admiral A. H. Van Keuren is seen—in solus. In the third row, left view, Capt. Johnson and Earl Thacker are greeted by Arthur Tode. Center view shows Benn Barber, Thos. A. Scott and Robert Lee. At the right: Charles Pearsall and Harmon Lewis. Lower row, left to right: Kenneth Dawson, S. B. Turman, J. E. Slater, Comm. Richard S. Field, President Scott and Mark O'Dea. The gentleman at the extreme right is J. Lewis Luckenbach



Behind the Scenes!

Tremendous volumes of work for the smooth operation of the Convention-Conference emanated from Official Headquarters at the Fairmont in San Francisco, where these photos were taken.

Top left is Jerry Scanlon who pounded out the publicity which went nation-wide. That's Honorary President Arthur M. Tode at the phone . . . giving an able hand. The three in shirt-sleeves are Eugene Hoffman, Secretary at San Francisco, Edward Harms, General Chairman and Mr. Tode.

Lower left: Comm. K. H. "Pat" Donavin welcomes Jerome B. Crowley, while Chief Greeter Ed Macfarlan watches. Center is Chairman Eddie Harms always in there pitching. To the right are Mr. and Mrs. Arthur Tode and Mr. Harms.

FRAZER A. BAILEY
member of the Board of Governors at San Francisco and vigorous worker on the American Merchant Marine Conference Committee

CHARLES L. WHEELER
president of The Port of San Francisco who presided at the many functions

The Golf Record

PROPELLER CLUB OF THE UNITED STATES GOLF TOURNAMENT . . . OLYMPIC CLUB SAN FRANCISCO . . . OCTOBER 21, 1941

Low Gross for Tournament

Winner . . . . George Schirmer
Runner-up . . . . R. A. Adams

**Low Net for Tournament
Propeller Club National Perpetual Trophy**

Winner . . . . John C. McHose
Runner-up . . . . Vernon S. Showell

**Low Net—Pacific Coast Clubs
National Headquarters Prize**

Winner . . . . Hugh Gallagher

**Low Net—San Francisco Propeller Club
New York Propeller Club Prize**

Winner . . . . Frank Lewis

First Flight

Winner . . . . J. Hildebrandt
1st Runner-up . .Kirkwood Donavin
2nd Runner-up . . . Russell Haviside
3rd Runner-up . . . . . . Walter Hill

Second Flight

Winner . . . . J. E. Peggs
1st Runner-up . . . Eugene F. Essner
2nd Runner-up . . . D. W. Lillevandt
3rd Runner-up . . . John Livingston

Guest Flight

Low Gross . . . . Don Moe
Low Net . . . . W. V. Lynch
Runner-up . . . . John Stein

Our photo shows the beautiful model calling attention to the resplendent prizes, as displayed in the lobby of the Fairmont Hotel ahead of the golf tournament. Donors of the prizes for the Propeller Club Tournament were: Bethlehem Steel Company, Moore Dry Dock Company, General Engineering & Dry Dock Co., United Engineering Company, Martin Ship Service Company, C. J. Hendry Company, Haviside Company, A. S. Gunn, J. Lewis Luckenbach, De Laval Steam Turbine Company, Shipowners Association of the Pacific Coast, Pacific Lumber Company, W. R. Grace and Company, Matson Navigation Company, American-Hawaiian S. S. Co., Western Ship Service Co., Army and Navy Club, National Headquarters, Propeller Club of the United States, Propeller Club, Port of New York

Closest to Hole—Eighth Green

Winner . . . . . . John T. Greany
1st Runner-up . . . . . . J. T. Eason
2nd Runner-up . . W. D. Vanderbilt

High Gross Score

Big Winner . . . . . . A. L. Mechling

Golf Committee

J. A. Lunny, Chairman
J. T. Greany, Vice Chairman
F. J. O'Connor
H. T. Haviside
A. J. Nolan
Vernon S. Shovell

Maynard Laswell

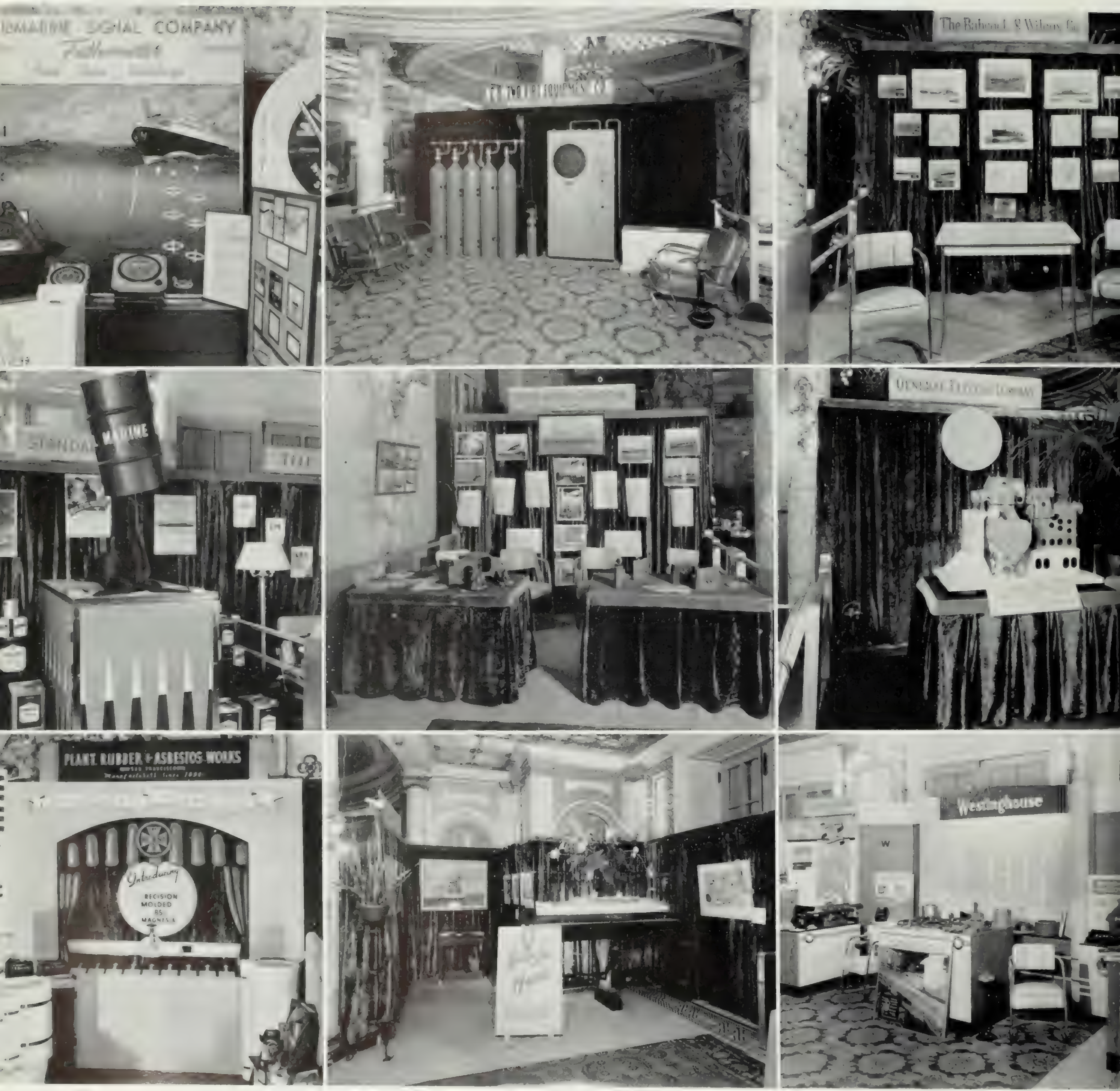
L. B. Pate *R. Ranney Adams*

Kenneth Dawson

Fifteenth Annual Banquet of th

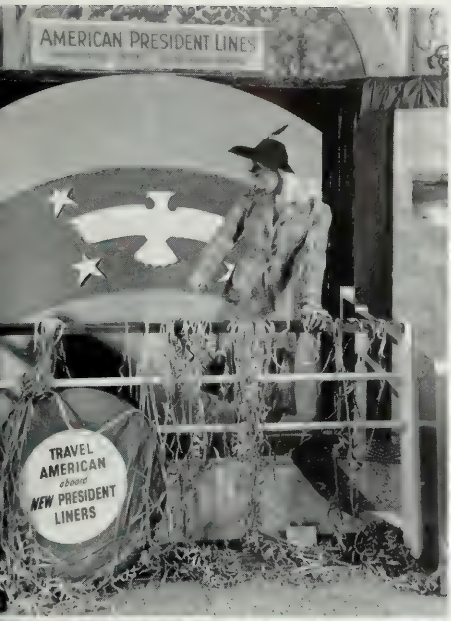
Propeller Club of the United States

OUR panoramic sweep shows only one-half of the thirteen hundred men and their ladies who attended the formal banquet. Two adjoining rooms at the Fairmont were required. The above view shows the dais for distinguished guests where Maritime Commission executives, steamship, shipbuilding and marine industry leaders were honored. Key speaker was Rear Admiral Emory S. Land, chairman of the U. S. M. C. His talk "America's Cross-eyed Stepchild—the Merchant Marine!" was broadcast Coast-to-Coast.



Exhibits

Highly acclaimed were the exhibits at the Convention-Conference—forty-six in number. Pictured here from number one at the top-left are displays of Submarine Signal Company, 2- C-O-Two Fire Equipment Co., 3-The Babcock & Wilcox Co., 4-Standard Oil Co. of California, 5-Foster-Wheeler Corp., 6-General Electric Co., 7-Plant Rubber & Asbestos Works, 8-Matson Navigation Co., 9-Westinghouse Electric & Manufacturing Co. On opposite page: 1-American President Lines, 2-Garlock Packing Co., 3-De Laval Steam Turbine Co., 4-Tubbs Cordage Co., 5-Grace Line, 6-Fairbanks-Morse, 7-Wm. Powell Company, 8-Edw. H. Fitler Rope Co., 9-The Texas Company

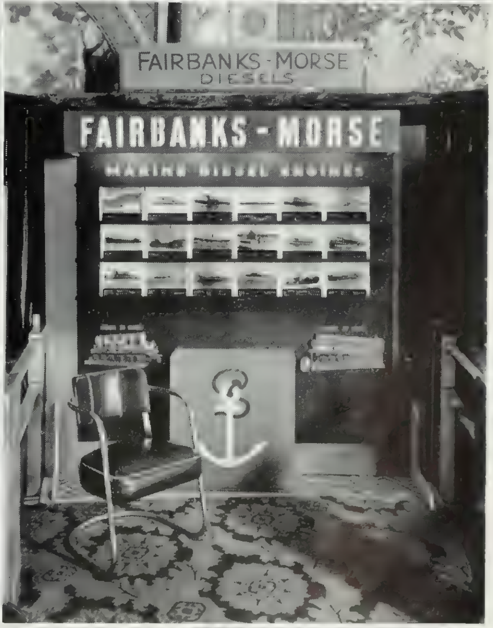

AMERICAN PRESIDENT LINES
TRAVEL AMERICAN aboard NEW PRESIDENT LINERS

The GARLOCK PACKING COMPANY

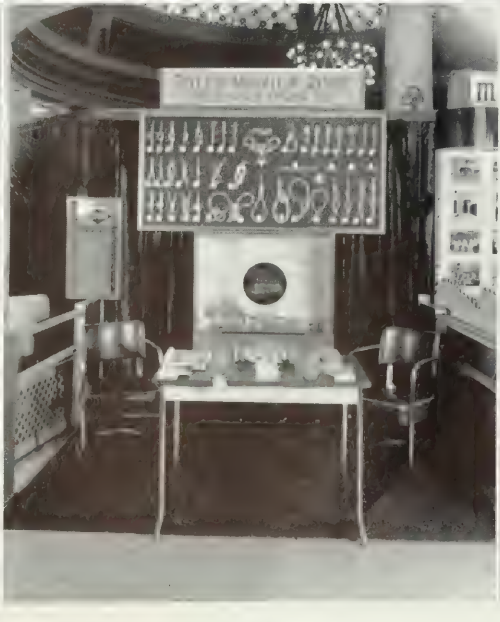
DE LAVAL STEAM TURBINE COMPANY

TUBBS CORDAGE CO.
SAIL TO PROPELLER
1856 1941
MANUFACTURING MARINE CORDAGE

GRACE LINE
GRACE LINE


FAIRBANKS-MORSE
DIESELS
FAIRBANKS-MORSE
MARINE DIESEL ENGINES

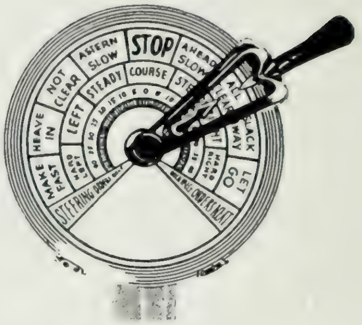
THE WM POWELL COMPANY



TEXACO
MARINE PRODUCTS

Steady as you go!

KNOWLEDGE IS THE STRAIGHT COURSE TO ADVANCEMENT



A Department for Deck Officers

by "The Skipper"

Questions Welcomed. Just Address "The Skipper," Pacific Marine Review, 500 Sansome Street, San Francisco, California

RULES OF THE ROAD

2—SOUND SIGNALS FOR VESSELS IN SIGHT OF EACH OTHER

In last month's opening installment of this series, we reviewed some of the most important doctrines of Admiralty Law applying to the Rules of the Road. This month we shall review the application of some of the various signals prescribed in the rules. The requirements of Article 28 of the International Rules, and also as noted in the accompanying Table A, that the signals prescribed in that article be given when vessels are in sight of each other, is defined to mean: "The term, 'when vessels are in sight of each other' is to be taken in its usual sense, meaning that signals are to be used when vessels are sufficiently near each other to make the use of signals necessary to an understanding of each other's courses." (Quotation from Spencer's "Maritime Collisions.")

Both the one- and two-blast signals prescribed for vessels in sight of each other, under the International Rules, are solely helm signals, they must be given whenever either vessel changes course in accordance with the passing, overtaking or crossing rules. Both the one- and two-blast signal is an indication that change of course is actually being made by the vessel sounding the signal, the other vessel cannot legally answer either the one- or the two-blast signal, unless she also changes her course in conformity with the signal she gives on her whistle or siren. As I shall explain in a later article of this series, many vessels have been held at fault in a subsequent collision following a failure to sound the proper signal when a change of course was made, or, on the other hand, failing to change course when sounding the one- or two-blast signal. However, the law does not say to what extent the course must be changed, therefore it becomes a very simple matter for the navigator to be safe and within the law by changing his course one or two degrees should he decide to sound either the one- or two-

SOUND SIGNALS FOR STEAM VESSELS IN SIGHT OF EACH OTHER

All signals shall be given on the whistle or siren.
(Symbol) — short blast of one second duration.

Signal	*International Rules*	*Inland or Pilot Rules*
— *(one short)*	*Art. 28.* "I am directing my course to starboard" (No answer required)	*Art. 18,* Rule 1; for meeting vessels: "Port to Port passing" (Answer required) *Art. 18,* Rule 8; by an overtaking ship: "I desire to pass on your starboard hand" (Assent required) *Pilot Rules,* signal section; by the privileged vessel in a crossing situation: "I intend to hold my course and speed" (Answer required)
— — *(two short)*	*Art. 28.* "I am directing my course to port" (No answer required)	*Art. 18,* Rule 1; for meeting vessels: "Starboard to starboard passing" (Answer required) *Art. 18,* Rule 8; by an overtaking ship: "I desire to pass on your port hand" (Assent required)
— — — *(three short)*	*Art. 28.* "My engines are backing full speed"	*Art. 28.* "My engines are backing full speed"
— — — — *(four or more short blasts)*	Omitted	*Art. 18,* Rule 3: "I do not understand your course or intention" *Rule 18,* Rule 8: "I object or cannot immediately comply"
Detonating signal	*Art. 12.* May be given by any vessel to attract attention. (Not a whistle signal)	*Art. 12.* May be given by any vessel to attract attention. (Not a whistle signal)

blast signal while in sight of another vessel, provided, of course, that a change of course is permitted by the steering and sailing rules.

You will notice, by referring to the accompanying Table A, that the one- and two-blast signals have an entirely different meaning in the two sets of Rules of the Road. In the meeting situation on inland waters of the United States, the one-blast signal means a "port to port passing" whether or not a change of course is necessary to safely perform this maneuver; this signal must be answered by the other vessel whether or not she has to change course in order to pass safely. Pilot Rule III requires that both the one- and two-blast passing or meeting signals shall be given and answered when the vessels are within one-half mile of each other.

To emphasize the importance of knowing the difference in the meaning of the one- and two-blast signals as prescribed in the International and Inland Rules, the following incident is brought to mind. Two American vessels were involved in a collision on the inland waters of the United States. During the trial the defending attorney for one of the vessels, while cross-examining the master of the opposing vessel, asked this question: "Captain, what is the meaning of the one-blast passing signal as prescribed by the Inland Rules?" The captain, a man of many years' experience, jauntily replied: "It means 'I am directing my course to starboard,' of course," to which the attorney replied, "Witness excused." It is a matter of record that the captain's erroneous answer had great bearing upon the final outcome of the case, in which both vessels were held to blame and the divided damage rule was applied.

In the overtaking situation under the inland rules, the one-blast signal given by the overtaking vessel means that she desires to pass on the starboard side of the vessel ahead; this signal must be given and answered either by a like signal of assent or the danger signal of dissent, whenever the vessels approach within one-half mile of each other, whether or not a change of course is necessary to safely accomplish the passing maneuver.

The signal section of the Pilot Rules for Inland Waters of the United States permits the privileged vessel, in a crossing situation, to signify that she intends to hold course and speed by sounding one blast of the whistle, this signal must be answered by the burdened vessel. This provision was upheld by the Circuit Court of Appeals of California in 1924 and is now apparently the law on the Pacific Coast; in view of this judicial decision, good seamanship make its use a requirement on all our inland waters. However, such a signal must not be used by a privileged vessel on the high seas where the International Rules govern.

As already mentioned, the two-blast signal is solely a helm signal under the International Rules and means "I am directing my course to port"; under the inland rules, it means, in the meeting situation, "a starboard to starboard passing," and must be given and answered by either a like signal of assent or by the danger signal of dissent, whenever the vessels approach within one-half mile of each other, regardless of whether or not a change of course is necessary. When the two-blast signal is used by the overtaking vessel on inland waters, it means that she desires to pass on the port hand of the vessel ahead; it likewise must be answered by a similar signal of assent or by the danger of dissent, whenever the vessels approach within one-half mile of each other.

The three-blast signal has the same meaning in both the International and the Inland Rules, namely, "My engines are backing full speed." However, notwithstanding the text of the statutory article of the rules, our Courts of Admiralty have extended, and upon numerous occasions, sustained, its use to cases where engines are reversed at less than full speed. In close quarters, the value of the information given by this signal is apparent; our courts now sanction its use to signify that the vessel is actually making sternway through the water, regardless as to whether the engines are backing full speed or not. This doctrine was applied in the San Juan vs. Harry Luckenbach collision case some years ago in Los Angeles. The use of the danger signal, not less than four short and rapid blasts of the whistle, is authorized only in the Inland Rules, as mentioned last month in answer to a question. Its use is both authorized and required in clear weather or fog, whether the vessels are in sight of each other or not, whenever the circumstances of a situation are such as to require its use to assure safe navigation in case of a disputed or misunderstood signal. The danger signal is not authorized by the International Rules, nor has its use ever been sanctioned by the courts; so regardless of how convenient and appropriate its use may be on the high seas, the navigator will use it at his own risk and with peril of being accused of using an unauthorized signal.

A detonating signal is the firing of a gun or other explosive signal that cannot be mistaken for a distress signal. This is an optional signal providing means of attracting the attention of a burdened vessel which may not have discovered the other vessel's presence. This is the only legal sound-signal that can be made by a privileged vessel on the high seas to attract the attention of another vessel; however, such a signal is not a requirement and it is seldom used by modern steamers; no vessel has ever been held at fault for failure to use the detonating signal.

The navigator must always remember that the one-blast signal, two-blast and three-blast signals can be used only when vessels are in sight of each other; the danger signal must be used at any time, in any weather, when its use is deemed necessary; and the use of the detonating signal is purely optional.

QUESTION

Dear Skipper:

Can you answer the following question? I am unable to find an authentic answer in any text book available on my ship.

"If a sailing vessel at anchor during a gale is being towed up to her anchors, should she exhibit lights for a vessel at anchor or for a vessel being towed?"

Yours truly,

A. M. B.

ANSWER

The sailing vessel is a vessel "at anchor" and should exhibit the anchor light or lights as prescribed in Article II, but the tug towing her is "underway" and should exhibit the towing lights as prescribed in Article 3.

This is a very good question, and, to the best of my belief, the only case on record in which a judicial decision was rendered is that of the ship Romance, to be found in Aspinall's "Maritime Cases of Nova Scotia."

QUESTION

Does a steam vessel that is broken down and not under command at night on the high seas show the masthead lights and the side lights in addition to the two red lights?

ANSWER

A steamer that is "not under command" on the high seas **shall not** show the masthead light at any time; the two red lights that are prescribed in Article 4 (a) of the International Rules are to be **used instead of the white masthead light.** If the vessel is making way through the water, she shall display the two red lights and also the red and green side lights; but if she is underway but stopped and dead in the water, then she shall extinguish the red and green side lights and display only the two red lights.

Location and characteristics of the two red lights:

They shall be in a vertical line at least six feet apart and visible all around the horizon for a distance of at least two miles; the lower red light should be at a height above the hull of not less than twenty feet; and, if the beam of the vessel exceeds twenty feet, then not less than the beam, but need not be carried at a greater height above the hull than forty feet. With modern steamers having very high superstructures, it is essential that the two red lights be sufficiently high as to avoid any "blind spots" being formed by deck houses, etc.

QUESTION

Can the two red "not under command" lights be used by a vessel that is broken down and not under command while on the inland waters of the United States?

ANSWER

No, they cannot be used on account of:

1. The use of the two red "not under command" lights is not authorized in the Inland Rules of the United States.
2. The two red lights in a vertical line have other meanings under the Pilot Rules for Inland Waters of the United States, namely:
   - (a) For a vessel at work on or over a wreck.
   - (b) For both stationary and to some extent moving dredges.
   - (c) For the end of a pipe line attached to a dredge.
   - (d) For a Coast and Geodetic Survey vessel at anchor in a fairway on surveying operations.

Therefore, should a vessel broken down and not under command, while on the inland waters of the United States, display such a signal, she would be giving false information to approaching vessels; should collision occur, the vessel would be held liable for displaying wrong lights.

Nor could she by day display the two black balls or shapes in a vertical line, as prescribed in Article 4(a) of the International Rules, for a vessel not under command on the high seas; the use of the two black balls or shapes is applied to other purposes in the pilot rules for inland waters of the United States, namely:

(a) A self-propelled suction dredge underway with her suction on the bottom.

(b) A Coast and Geodetic Survey vessel at anchor in a fairway by day and engaged on surveying operations.

QUESTION

What signal could be displayed by a steam vessel not under command while in United States inland waters?

ANSWER

If possible, the steamship broken down and not under command should come to anchor at once; she could then display the regular anchor light or lights by night as prescribed in Article 11, or the black ball by day as prescribed in Pilot Rule 6. If it is impossible to anchor on account of deep water or for other reasons, then the vessel remains "underway" and can show only the regulation running lights for a vessel of her class; however, she could use the danger signal to warn other vessels away if necessary. There is nothing to prevent a vessel displaying the international code flag signals by day, if deemed necessary, to inform other vessels of her peculiar situation.

QUESTION

What is meant by the term "Not under command"?

ANSWER

In general, the question as to whether or not a vessel is "not under command" and entitled to display the "not under command" signals while on the high seas is one to be decided by practical navigators on the particular vessel. However, here are a few general rules:

(1) The signal must not be used as a matter of convenience to the individual navigator in order to "hog the road."

(2) The vessel must be unable to properly maneuver, owing to some disablement.

(3) The vessel must be unable to get out of the way of another in the manner reasonably to be anticipated by the other vessel.

(4) "Not under command" signals are not signals of distress.

QUESTION

Dear Skipper:

I am third mate on a steamer operating on the Pacific Coast. I would appreciate knowing if there is any short and concise "rule of thumb" that will enable a navigator to mentally ascertain the approximate rate of approach of two vessels in feet per minute?

Yours truly,
K. M. A.

ANSWER

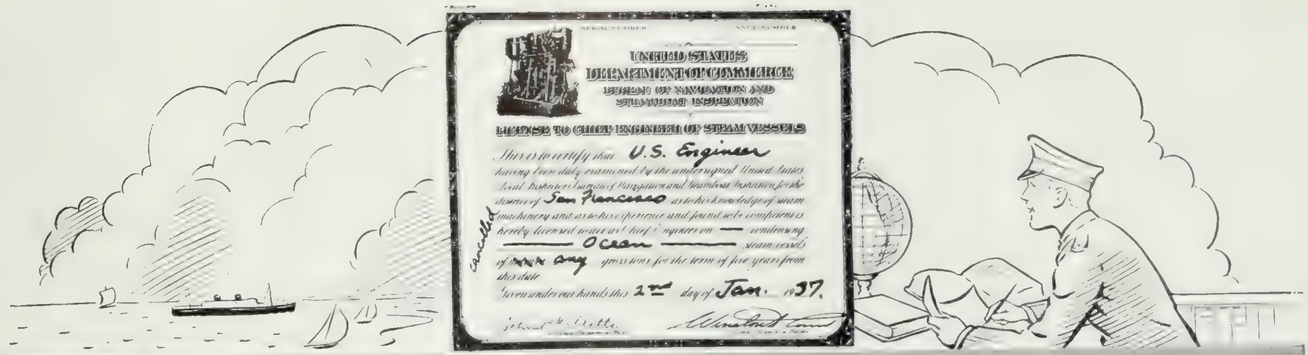
Yes, there is such a formula. Vessels approach each other in a meeting situation at a rate equal to the sum of their combined speeds; therefore:

Sum of the combined speeds x 100 equals the approximate rate of approach in feet per minute.

Example: Two vessels, each making ten knots, are meeting head on; the sum of the combined speeds is 20 knots, therefore, the approximate rate of approach is 20 x 100 equals 2000 feet per minute.

In the overtaking situation, the rate of approach is the difference of the two speeds. For example, a vessel making 15 knots is overtaking a vessel making 10 knots; the difference in speeds is 5 knots, therefore the overtaking vessel is approaching and closing up the distance at the rate of 5 x 100 equals 500 feet per minute.

This series will be continued next month with a clarification of the various sound signals used by vessels while obscured in fog and not in sight of each other.



UNITED STATES
DEPARTMENT OF COMMERCE
BUREAU OF NAVIGATION AND
STEAMBOAT INSPECTION

LICENSE TO CHIEF ENGINEER OF STEAM VESSELS

This is to certify that U.S. Engineer having been duly examined by the undersigned United States Local Inspectors Bureau of Navigation and Steamboat Inspection for the district of San Francisco as to his knowledge of steam machinery and as to his experience and found to be competent is hereby licensed to act as Chief Engineer on — condensing — Ocean — steam vessels of any gross tons for the term of five years from this date

Given under our hands this 2nd day of Jan. 1937.

Cancelled

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ENGINEERING THERMODYNAMICS

5—EFFECTS OF ADDING HEAT

QUESTION

What are some of the effects of adding heat to substances?

ANSWER

Man's ability to control heat in substances and objects is universally useful and profoundly interesting. Without it we would be robbed of most of our technological developments, and there would be little use for the engineer.

Basically, the three possible effects of adding heat are:

(1) A change in temperature.

The energy equivalent of the heat added goes into doing *internal* work on the substance. There are many cases where heat added does not change temperatures. For instance, when a liquid changes to a gas (boiling water); also when a solid changes to a liquid (melting a metal). There are no cases where adding heat lowers the temperature. The refrigeration process requires heat to be added, but it raises the temperature high enough so that much more heat may be dumped into the air or seat heat reservoirs than is added at the beginning. This will be discussed in detail in future articles.

(2) A change in state or condition of the substance.

Heat may be added and the energy equivalent goes into separating the molecular structure (breaking the molecules apart, so to speak, so that they leave the parent body of the substance to form a different condition of the same chemical substance). Examples are: melting ice; boiling water. Here no change in temperature is involved.

Also, many chemical reactions are started or accelerated by the addition of heat. Heat temperature may be raised also. For instance, the chemical reactions of oxidizing are started by raising the temperature of a fuel to the point where oxidation proceeds rapidly. From then on, the heat of oxidation continues to raise the fresh fuel temperature, the process becomes continuous and self-supporting, and we have fire or combustion.

(3) A change in the shape and size of a substance.

Heat may be added and the energy equivalent goes into doing external work of expansion. Nearly all substances change size slightly with the addition of heat. We normally think of this as due to a change in temperature, but temperature is only a condition; heat must be added to get the expansion. Gases, steam and other vapors expand when their temperature is raised, the heat added going into the work of pushing back the restraining medium against a pressure.

QUESTION

What are some of the secondary effects of heat addition?

ANSWER

Expansion and contraction.

Sublimation, changing from solid to a gas.

Chemical combination, decomposition, and dissociation.

Change in viscosity.

Adsorption—gases being driven off from metals.

Solubility of solids in liquids.

Electrical resistance.

Changes in strength of substances.

Changes in color and texture of substances and metals.

QUESTION

What are some of the more useful facts concerning expansion and contraction?

ANSWER

The correlation between heat and expansion of gases and vapors is the very foundation of steam engineering. There is no known method of getting mechanical energy from heat other than through the powers of expansion.

(Let readers review their knowledge and challenge this statement in a letter to "The Chief.")

Therefore, we will have a full discussion of the expansion of gases in later articles.

Expansion of Metals

There is a great deal of useful knowledge about expansion of metals which engineers should have.

Most substances expand when heat is applied. An exception is water, which contracts slightly when heated from 32° F. to 39.2° F. Further rise in temperature causes expansion, as indicated in the accompanying table.

Density of Water Pounds per Cubic Feet

Temp. F.	*Density*	*Temp. F.*	*Density*
32	62.42	350	55.57
39.2	62.43	400	53.5
50	62.42	450	51.2
100	62.00	500	48.7
150	61.2	550	45.6
200	60.12	600	41.5
250	58.83	650	36.0
300	57.33	700	25.4
		706.1	19.2

Expansions of metals are very useful in engineering. Different metals having different rates of expansion permit of many devices to indicate temperature. If brass and steel are welded together continuously along the length of a strip, a change in temperature causes a curve in the strip. This is used to make contact or operate small air valves acting as a thermostat. The balance wheel of a good watch is compensated for temperature changes with such a couple.

Shrink fits of hubs, flanges, or wheels on shafts use expansion. By heating the hub and wheel in a flame, its bore, originally smaller than the shaft, slips on easily and cooling grips the shaft. This fit is calibrated by boring the hole smaller than the shaft by a proper amount.

The bore is less than the shaft .001" to .0015" per inch of diameter of shaft.

The shaft may be reduced by shrinking, using dry ice (carbon dioxide compressed and solidified into a snow.)

Ball bearings are properly mounted by heating in an oil bath at 180 to 200° F. before slipping the inner race on the shaft. The shaft is larger than the bearing bore by about .0003" per inch of diameter.

QUESTION

How can expansion and contraction be calculated?

ANSWER

The expansion rate of most metals, alloys and substances has been measured and tabulated in reference books. This expansion rate is called the COEFFICIENT OF LINEAL EXPANSION. It is simply the change in length in inches per inch of length for each degree Fahrenheit of temperature change.

To compute the change in length or diameter of a shape we have:

Change in length = change in temperature × length × coefficient of lineal expansion.

Table of Coefficients, E

E = inches change per inch of length per ° F.

Metals	E
Aluminum	.0000123
Brass, cast	.0000104
Bronze	.0000100
Copper	.0000093
Iron, cast	.0000059
Iron, forged	.0000063
Lead	.0000151
Steel, hard	.0000056
Steel, 10% nickel	.0000073
Zinc	.0000165

Example: Find change in length of a steam pipe 20 feet long, carrying 700° steam from cold 70° F. room temperature to hot temperature.

Solution: 20 feet = 240 inches.
700 — 70 = 630° F. change in temperature.
Coefficient E from table is .0000073.
Then—
240 × 630 × .0000073 = 1.104 in.

NOTE: The coefficient changes slightly with high temperatures, but for ordinary use, the tabulated values are satisfactory. There are also slight changes as the alloy and treatment of steels vary.

Problem: A shaft is 10 inches in diameter, exactly. A flange to be shrunk on is bored out to a diameter of 9.990 inches. To slip it on easily it must be heated until its diameter of bore is 10.010 inches. The shaft is at 100° F. when the fit is put on. To what temperature approximately must the flange be heated.

Solution: Total change in diameter of bore is 10.010 — 9.990 = .020 ins.
Coefficient E from table, .0000063.
.020 = 10 × .0000063 × ° F.
.020 = .000063 × ° F.
F.=.020 divided by .000063.
° F.= 318 = change in temperature.

318 + 100 = 418° F. total temperature to which the flange must be heated.

In practice, the temperature is approximated by touching the hot piece with a piece of pine wood. Approximately 350 to 500° F. would be good for this job and it would blacken and slightly smoke a piece of pine wood.

There are many interesting applications of these simple rules. The engineer should note the many provisions made on the ship to allow for these changes in dimensions due to changes in temperature.

QUESTION

Do liquids also expand with the temperature increase?

ANSWER

The cubical or volumetric expansion of liquids is also measured by a coefficient of cubical expansion, Ec.

The value of this coefficient for some common liquids is shown in the accompanying table. Ec is the units of volume change per unit per ° F. temperature change.

Table of Coefficients of Cubical Expansion

Liquid	*Ec*
Alcohol	.00061
Benzine	.00077
Calcium chloride, 50%	.00028
Olive oil	.00041
Fuel oil	.00055
Lube oil	.00055
Sodium chloride, 25%	.00024
Water	.00010

NOTE: Ec for water varies widely at various temperatures, as discussed earlier in this article.

However, the Ec cubical or volumetric coefficient of any substance may be taken as three times the lineal coefficient. Thus, the lineal coefficient for steel is .0000063 and the volumetric coefficient is .0000189. The volumetric coefficient for fuel oil is .00055 which is so much more than for steel that it is hardly worth while to make corrections for the tank expansion.

Steam Generation

ON MODERN MOTORSHIPS

A gradual but definite progress in the application of steam boilers for diesel-driven vessels has taken place since the early developments of motorships. Recognition was given to the great loss of heat in the exhaust of the large diesel engines. Engineers of the Foster Wheeler Corporation set out to recover some of this heat, and improve the overall plant efficiency through the use of suitable waste heat boilers.

The atmosphere of exhaust gas passages is highly corrosive in character. "Sweating" is encountered at times, and a sulphuric acid condition may be expected as a result of sulphur in the fuel. Quite evidently, steel was not suitable for such service. Eventually, a construction was developed which embodied a chamber with cast iron walls, the end walls being gas-tight tube sheets. Water heating elements of extended surface, composite construction are placed in the gas passage and project through the tube sheets to steam tight headers.

The heating surface is composed of steel tubes covered with cast iron gilled rings, shrunk in place to establish a metal-to-metal contact with the tubes. The rings used are 4⅝″ o.d. and provide six times the heating surface of the bare tubing. Tight fits of tongue and groove type are established between the rings and between rings and tube sheets at one end; the joints between tubes and supports are made flexible at the other end. This provides for expansion and contraction without stressing tube connections; all pressure joints are out of the gas passages.

The element tubes are placed horizontally in the gas passage and supplied with water from a single header at the bottom. Water circulation is downward from the steam drum to the header, thence upward through the various horizontal tubes in series and to the steam drum.

To provide the necessary steam supply for C-1 motorships, a design has been worked out, based upon long experience and the most practical and dependable arrangement. It involves a waste heat and oil fired boiler placed side by side and of approximately the same size. Each of these has a horizontal steam drum 36″ in diameter.

The Foster Wheeler Corporation waste heat unit for these ships is divided into two parallel sections by means of a vertical steel division plate, each section receiving the exhaust from one of the two main engines in the vessel. This assures proper gas velocity in each section, and as one engine is run while the other is shut down, heating conditions will be good; whereas they would be very poor if only one engine should exhaust into a unit designed for absorbing the heat from both engines. The waste heat boiler has 1440 square feet of heating surface and will generate 1750 pounds of steam per hour, 150 pounds gage pressure when the engine is running at 100 per cent of load. Since the engine hp is about 4000 this means approximately one pound of steam per every 2¼ hp.

The direct-fired unit, used during low speed operation, is of conventional cross drum sectional header, straight tube design. The furnace is of solid refractory, placed below a bank of boiler tubes through which the gases pass vertically to the stack. The two rows of tubes directly above the furnace are 2″ in diameter and the remainder of the tubes are 1¼″ in diameter. The tubes are closely spaced to provide even distribution of the gases over the heating surface and no baffles are used. This boiler has a furnace volume of 107 cu. ft. and will provide a normal steam output of 2400 pounds per hour with a maximum of 5660 pounds per hour.

To give an idea of compactness of these units which will provide all steam and heat for the ship, it should be realized that as installed, they are only 11 feet 7 inches wide, 11 feet deep and 12 feet 2 inches high to the center of the steam drum. In service, the heating unit has ample capacity for heating and operating small auxiliaries without any cost for additional fuel. This greatly improves the overall efficiency of the vessel from an oil consumption point of view. Making the units entirely separate and independent has a number of advantages, among which is the ability to brace the waste heat unit much more strongly and rigidly than is necessary for the direct-fired boiler. Pulsations in the exhaust may require stiffness in certain directions not necessary in direct-fired furnaces, and the two units have to be designed from entirely different points of view. The essential considerations are that they shall be simple, reliable, and involve minimum maintenance and care.

In view of the fact that some heat may be required at any time, steam will be maintained on the waste heat boiler constantly. It being impossible to vary the rate of steam generation other than by changing the load on the main engines, it is evident that the full capacity of the waste heat boiler, or a large part thereof, may have to be blown to waste through the safety valve. This would be an unjustifiable waste of fresh water, and to overcome it a condenser of the atmospheric type has been provided for the purpose of collecting and condensing the steam; also to serve as a storage tank for an appreciable quantity of condensate.

On the Ways - SHIPS IN THE MAKING

LATEST NEWS FROM AMERICAN SHIPYARDS

Bethlehem Launches Richfield Tanker

An important addition was made to the rapidly growing fleet of American tankers when the S.S. Charles S. Jones was launched at 10:00 A.M. October 11, 1941, at the Sparrows Point Yard of Bethlehem Steel Company, Shipbuilding Division. The new vessel, the keel of which was laid on May 21, 1941, is being built for Richfield Oil Corporation of Los Angeles, California, and is named for the president of the company. Mrs. Charles S. Jones was the sponsor.

The deadweight is about 12,900 tons and the tank capacity 101,400 barrels, or 4,258,800 gallons of oil. The cargo tank space is divided into 24 compartments, allowing many grades of oil to be carried at one time. Pumping capacity is designed to load or unload the vessels in less than 12 hours.

Her principal dimensions are as follows:

Length overall	463 feet
Molded beam	64 feet
Molded depth	34 ft. 10 in.
Draft	28 ft. 6 in.
Speed	13 knots

The propelling machinery consists of a single screw installation of Bethlehem cross-compound, double-reduction gear turbines, developing 3500 shaft horsepower. Steam will be supplied by two water tube, oil-burning boilers. The ship is fitted with a contra-rudder.

Extensive use of welding and application of the Bethlehem-Frear system to longitudinals and bulkheads insure a light, yet strong framing with a substantial increase in paying deadweight for the given displacement.

Modern and complete navigation equipment has been installed in the pilot house amidships. This includes complete Sperry gyro compass equipment, in addition to the magnetic compasses, and Sperry gyro-pilot automatic steering control. A Submarine Signal Co. Fathometer and an electric sounding machine are also installed, as well as a continuous three-day course recorder. Among interesting safety devices are independent radio receivers, an automatic S.O.S.

New Procurement Section Maritime Commission

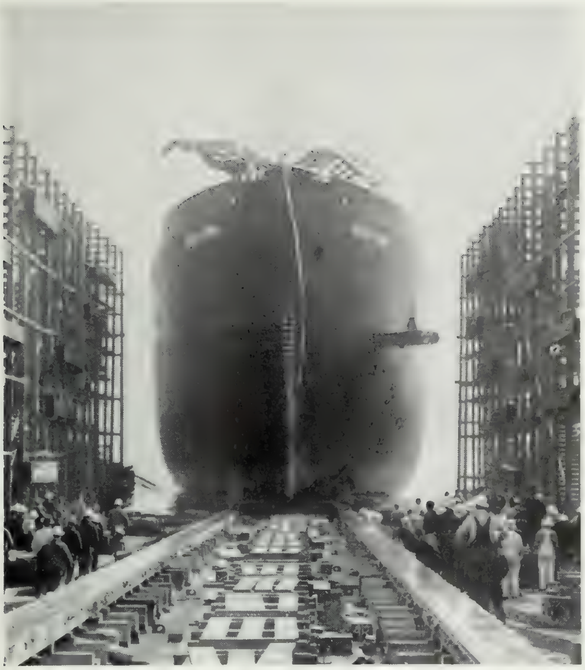
Purchase of all materials for the construction of emergency cargo vessels, known as "Liberty Ships," additional to the 312 originally ordered, and much of the material for other ships authorized under the Supplementary Appropriation Act of August 25, 1941, will be handled by the newly created Procurement Section of the United States Maritime Commission's Construction Division.

C. E. Walsh, Jr., has been appointed chief of the Procurement Section.

The Procurement Section has already begun purchasing materials for 200 of the "Liberty Ships," though allocation of the work among the Commission's nine emergency yards has not yet been completed. As a means of centralizing procurement of construction materials under one head, and thus reducing priorities problems to a minimum, the Commission is also planning to handle purchases for some of the standard type cargo vessels and tankers—purchases formerly handled by the individual shipyards.

Centralized purchasing for the earlier group of 312 "Liberty Ships," already contracted for under the Commission's original emergency program, was handled by the firm of Gibbs & Cox, New York, and is now about 90 per cent completed. The Commission's Division of Purchase and Supply will continue to handle procurement of other than ship construction materials.

Mr. Walsh is 35 years old and has been associated with the Bethlehem Steel Corporation for the past 15 years, specializing in purchasing. From January 1939, until his appointment to the Commission, Mr. Walsh handled all purchases for Bethlehem's shipbuilding plant, Sparrows Point, Maryland. He is a native of Pittsburgh, where he was graduated from Langley High School, and later attended the University of Pennsylvania.



British "Liberty V" freighter Ocean Viking sliding down the ways at Todd-California Shipbuilding Corp. yard, Richmond, California, October 24

receiver, radio direction finder, and complete radio communication equipment, one set of which has a range of about 2000 miles. Automatic alarms indicate burning out of running lights, failure of oil supply, and similar disturbances.

Excellent accommodations are provided for 13 officers and a crew of 30 men. The men are housed in 15 rooms, two men in each, while the officers have individual rooms. Accommodations also include smoking rooms and mess rooms for officers and crew, hospital, laundry, cold storage, and provision storage.

As the vessel will operate in warm climates, sufficient ventilation has been provided to insure fifteen complete changes of air hourly in all living quarters and mess rooms. Chilled drinking water is also supplied, an important feature on ships making tropical runs, and the ship has a distillation apparatus for emergency production of fresh water.

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September Records

The Maritime Commission's latest Ship Construction Progress Report, made public October 17, indicates that new records were set during the month of September in the number of ships launched and keels laid.

There were eleven Maritime Commission ships launched during the 30-day period, of which eight were the standard type cargo and passenger-cargo ships, and three were "Liberty Ships," the first group of this type ship to take to the water. All eleven ships were launched on the same day—September 27—as part of the coast-to-coast "Liberty Fleet Day" celebration and represented the greatest mass launching of ships since the World War. In addition, three

New Richfield tanker Charles S. Jones just after launching at Bethlehem's Sparrows Point yard

Cargo motorship Surprise just off ways at Sun Yard, Chester, Pa.

other ships—one tanker for private account and two freighters for the British Government—were launched the same day, making a total of fourteen.

Twenty-nine keels were laid during the same 30-day period, of which twenty-one were "Liberty Ships" and eight standard type. This also was a new high in the Commission's shipbuilding program.

Other data shown in the Progress Report include:

Eight standard type ships delivered to their operators during September.

Eighteen standard type ships in the 75-100 per cent stage of completion, of which six were scheduled for delivery during October.

Four "Liberty Ships," more than half completed, will be ready for delivery before December 31.

Twelve "Liberty Ships" were in the 25-50 per cent stage of completion. Most of these also will be completed before December 31.

"Liberty Ship" Launchings

The Pacific Coast continues her lead in the launchings of Emergency type "Liberty Ships."

Three of these vessels have been launched at the Oregon Shipbuilding Corp., as follows:

Star of Oregon, launched September 27; Meriwether Lewis, launched October 19; William Clark, launched October 26.

Two were launched by the California Shipbuilding Corp., as follows:

John C. Fremont, launched September 27; Thomas Paine, launched October 26.

Seven of these vessels have been launched to date, the other two having been launched at the Bethlehem Fairfield Shipyard, Baltimore, Maryland, as follows:

Patrick Henry, launched September 27; Thomas Carroll, launched October 25.

Maritime Commission progress reports show that during November approximately 25 more "Liberty Ships" will take to the water, and that about 20 will be completed and ready for operation by December 31.

Todd-California Delivers 1st—Launches 5th

The Todd-California Shipbuilding Corp. at Richmond, California, on October 24 launched the Ocean Viking, fifth hull of 30 standard emergency type cargo carriers for the British Purchasing Commission, and on October 27, delivered Ocean Vanguard, first of the series.

A complete illustrated description of Ocean Vanquard will be found on page 28 of this issue.

Concrete Barge Contracts Awarded

The Columbia Dry Dock and Shipbuilding Co., a newly organized barge-building firm, was awarded by the Maritime Commission a contract to build five concrete tank barges, especially designed for carrying petroleum products coastwise.

These barges are to have a capacity for approximately 7000 tons. They have no power plants and will be towed by tugs now building.

Identical contracts were let to an Atlantic Coast and a Gulf Coast organization. These contracts are said to be the complete extent of the Maritime Commission program for concrete construction.

More Tanker Contracts

On October 11, the Maritime Commission awarded contracts for the building of 49 tankers. Thirty-six of these are to be built by the Alabama Dry Dock and Shipbuilding Co., Mobile, Alabama, and 13 by the Sparrows Point yard of the Shipbuilding Division of the Bethlehem Steel Company.

Cargo motorship Surprise at outfitting dock after launching, Sun Yard, Chester, Pa.

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Steamer James McKay just after launching at Sparrows Point

Sun Launches A C-2 Cargo Carrier

On October 18, the Sun Shipbuilding & Dry Dock Co. launched a C-2SU type cargo motorship, fifth of a contract for eight vessels. This hull was named Stag Hound after a famous American Clipper sailing ship and is allotted to the services of the U. S. Lines.

The first of this series of eight vessels was delivered to the American Mail Line of Seattle on October 10. This ship, the China Mail, is now on her way to the Pacific Coast.

Union Bethlehem Launches Destroyer

On Thursday, October 30, at 9:00 a.m., the Union Plant of the Shipbuilding Division of the Bethlehem Steel Co., Inc., launched the first of its present large program of destroyers for the United States (two-ocean) Navy. Christened Laffey by Miss Eleanore Foggerty, this ship when completed, will be of 1650 tons displacement (the Bristol type), and will be equipped with five-inch guns and 21-inch torpedo tubes. Keel for this hull was laid January 13, 1941.

Gulf Shipbuilding Contracts for 14

Signing of contracts with the Gulf Shipbuilding Corporation, Mobile, Alabama, for construction of 14 cargo vessels of a modified C-2 type was announced September 15 by the United States Maritime Commission. The vessels will be built as part of the Commission's expanded Defense Program, calling for production of 566 additional merchant carriers, under the Supplementary Appropriations Bill signed by President Roosevelt August 25.

Completion of negotiations with the Gulf Shipbuilding Corporation marks initial participation by that yard in the Commission's drive toward the goal of two ships launched a day in 1942 and 1943. The contract price for each ship is $2,520,000. The first is to be delivered September 1, 1942, and the last December 31, 1943.

Commission Lets Contract For Nine Cargo Ships

Award of a contract to the Penn-Jersey Shipbuilding Corporation, Camden, New Jersey, for construction of nine small bulk cargo ships was announced September 19 by the Maritime Commission.

The contract was authorized on a price-minimum fee basis at an estimated price of $800,000 per vessel. The first ship is to be delivered 270 days after the signing of the contract, with subsequent deliveries at 30-day intervals.

Six C-3s Awarded Ingalls

On October 7, the Maritime Commission announced an award of a contract to the Ingalls Shipbuilding Corporation to build six C-3 cargo vessels at a cost of $3,160,000 per ship

These vessels will be built at the Pascagoula, Miss., yard and delivered during 1943, scheduled dates being May 30, July 30, September 30, October 15, November 15 and December 15.

Brunswick Gets Award Of Four Tugs

U. S. Maritime Commission on October 7 awarded to the Brunswick Marine Construction Corp. of Brunswick, Georgia, a contract to build four small harbor tugs to cost $290,000 each.

General Ship Gets Two Tugs

The Maritime Commission on October 7 awarded to the General Ship & Engine Works of East Boston, Massachusetts a contract to build two small harbor tugs at a cost of $290,000 for each tug.

Sun Launches Another Tanker

On October 11, the Sun Shipbuilding & Dry Dock Co. at Chester, Pa., launched the tanker Aekay for the Maritime Commission and the Keystone Tankship Corporation. Miss Barbara Vickery, daughter of Maritime Commissioner and Mrs. Howard L. Vickery, acted as sponsor.

Aekay is one of two new tankers for Keystone. She is a single-screw, turbine-driven steamer, 520 feet long, with a sea speed of 16½ knots, and with 16,400 tons deadweight capacity, and cargo tanks to take 133,000 barrels.

American Shipbuilding Gets Six Ore Carriers

On October 11, the Maritime Commission announced an award to the American Shipbuilding Company of a contract to build six large ore carriers for Great Lakes service.

Four of these ships will be built at the Lorain plant and two at the Cleveland plant, all for delivery during 1943.

The design calls for a length of 595 feet, a beam of 60 feet, and a depth of 35 feet. Driven by steam triple-expansion engines of 2500 ihp, they will carry 12,000 tons of ore on 22 feet draft.

Savannah Awarded Twelve EC-2s

A contract for 12 "Liberty Ships" was awarded October 11 to the Savannah Shipyards of Savannah, Georgia, by the Maritime Commission on a cost fixed-fee basis. The total amount of this contract will be between $18,000,000 and $20,000,000.

A three-way yard was recently completed by this corporation.

Ten Ore Carriers To Great Lakes

The Maritime Commission on October 14 announced the award of a contract to the Great Lakes Engineering Works, River Rouge, Michigan, for the construction of ten bulk ore carrier vessels for the Great Lakes.

Six of the carriers will be constructed at the company's River Rouge yard, while the other four will be built at the company's Ashtabula, Ohio, plant. All will be delivered during the Spring of 1943. The estimated cost is $1,850,000 for each ship.

Launches a Hull, Lays a Keel

As soon as the passenger-cargo ship African Planet was launched at Pascagoula, Miss., on "Liberty Fleet Day," Saturday, September 27, the keel for a second passenger vessel, the American Farmer, was laid on the same ways. This dual ceremony took place in the yards of the Ingalls Shipbuilding Corporation.

The African Planet, third sister ship for the American-South African Line, Inc., fleet to come from this yard, is a combination passenger-cargo carrier, type C-3. Each vessel can accommodate 122 passengers and, for this service, have the latest and most modern equipment. They displace 18,500 tons, are 489 feet in length with a beam of 69½ feet and a draft of 27 feet 3 inches. Their speed is 19 knots.

The American Farmer, whose keel was laid the same day, is to be a combination passenger-cargo liner for the United States Lines. It has been designed to accommodate 2500 troops in addition to officers and crew, if needed for the United States transport services.

Five Large Ore Carriers

The Pittsburgh Steamship Company, subsidiary of the U. S. Steel Corporation, is building five steamers that will be in operation at the opening of the season in 1942, and will be the largest ore carriers on the Great Lakes.

Two are under way at the Loraine yards of the American Shipbuilding Company, and three are at the River Rouge Plant of the Great Lakes Engineering Company.

These steamers have an overall length of 640 feet, a beam of 67 feet, a depth of 35 feet, and an ore capacity of 17,500 tons.

Dravo Busy

Dravo's two yards, one at Neville Island, Pittsburgh, the other at Wilmington, Delaware, are very busy these days with 159 craft, aggregating 76,144 gross tons, on order or under construction.

This total includes:

15 submarine chasers, and
5 mine sweepers for U. S. Navy.
3 floating cranes for U. S. Navy Yards.
6 floating caisson gates for graving docks.
17 covered lighters for U. S. Navy.
113 welded steel barges, dump scows, car floats.

Carelessness as a Cause of MARINE Industrial Accidents

By Byron O. Pickard

As a general rule, all industrial accidents are brought about by a combination of unsafe environment and unsafe acts of workmen.

In our statistical studies of accidents resulting in injuries to longshoremen and seamen on the Pacific Coast, we investigate and analyze each year an average of 8800 accidents. There are, very naturally, limits to the accuracy of statistical results, due to the limited number of classifications which can be used. We are faced, therefore, with the necessity of weighing the relative importance of unsafe environment and unsafe acts in making our statistical determination of the responsibility for non-prevention of each accident.

Those accidents which seem to be the result predominantly of such things as unsafe conditions of working places, unsafe gear, and the use of unsafe methods are ascribed to faulty employer supervision. When the reason for the accident seems to be predominantly some action of the workmen, it may usually be ascribed to one of the following: "Thoughtless or ignorant acts while walking or climbing; while handling objects; while operating machinery; or while engaged in performing some other operation." Last year (1940) out of 6350 accidents resulting in injuries to longshoremen, about 5920 clearly fell under either faulty supervision or unsafe acts of workmen. The remainder were due to conditions which neither the stevedore employer nor the longshoremen could reasonably be expected to control, such as unsafe condition of container, wind-blown dust, stowage in another port, or storms.

You will be interested, I am sure, in the responsibility assignment between supervision and longshoremen as shown by the table herewith:

Responsibility Assignment for Accidents

Number of Accidents	*Type of Accident*	*Supervision*	*Longshoremen*
1200	Falls of Persons........	55%	45%
800	Falling Objects	70%	30%
1000	Moving Objects	60%	40%
80	Flying Objects	75%	25%
2600	Hand Handling	30%	70%
40	Machinery	50%	50%
5920		47%	53%

On the basis of this analysis, it seems, therefore, that, although the responsibility was fairly evenly divided between supervision and employees, the unsafe or "careless" acts of workmen predominated to some extent.

A "Means of Prevention" study by our safety engineers revealed, however, that 75 per cent of the accidents could have been prevented if the longshoremen had been given proper training.

Thus, although more than half of the accidents were caused essentially by unsafe acts of workmen, proper training would not only have prevented these but also about half of the accidents caused primarily through unsafe environment. Were men properly trained by supervisors, they would themselves correct many unsafe conditions and would avoid injury in many cases in which it was impractical to do so.

Although we have used the term "Thoughtless, ignorant or chance-taking acts," "Carelessness" (meaning neglectful, indifferent or heedless), could often have been used. The reason for not using it is that once a cause has been designated as "carelessness" on the part of the injured workman, the management may feel that it has thereby cleared itself of all responsibility for preventing that particular accident, and very likely for preventing a recurrence of a similar one. Since training and supervision are the responsibility of management, management itself may have been directly responsible for the careless act, and may itself have been careless in its handling of the man before he was injured.

There was a case recently which illustrates clearly how easy it is to blame an accident on carelessness and dismiss it without action. Bales of gunnies were being loaded in the forward half of the square of No. 4 hatch. The after half was empty and the pile was up about ten feet. A bale was landed about two feet back from the edge of the stowed cargo, and one of the longshoremen hooked the strap of the bale and, backing up to the edge of the stowed cargo, pulled the bale toward him. The strap broke, the man fell, landing in the hold.

The cause of this accident is the usual combination of unsafe conditions and unsafe acts. The unsafe condition—lack of a safety net. The unsafe act—hooking into the strap of the bale and pulling, rather than pushing it to the edge of the pile. As the unsafe condition had been present al-

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most every time the ship was loaded or unloaded for many years, the accident, in the minds of the supervisors, was blamed entirely on the man. "He should have known better."

Actually, in addition to providing a net which would have guarded the man against injury from his unsafe acts, management might have considered the method of handling which was used. Had some of the strain been taken on the winches, it would have been a simple matter to swing the bale into position. Had management accepted its responsibility for enforcing the use of proper handling procedures, there would have been less opportunity for chance taking.

As for the unsafe act of the man, it is reasonable to believe that he had pulled other loads toward the edge of the pile and hooked onto strapping of bales on many previous occasions. There was direct supervision in the form of a hatch boss or winch driver who should have looked for these unsafe acts and corrected them. Here again it would seem that, although the man was acting in an unsafe manner, it was perfectly possible for management to have at least made efforts to correct this practice before an injury resulted.

Of course, the stock answer of the ordinary supervisor to such a suggestion is that the men will not accept instructions and warnings regarding their unsafe acts. What happens, however, when cargo is lost or damaged through the acts of these same men? Although management seems willing to let an injury claim for several thousand dollars go through with the simple explanation that the man was careless, a like claim for cargo damage could not be so easily explained. There is no doubt that in the latter case an investigation would be made to find out just who was responsible. If the cause were traced to a "thoughtless or ignorant" act of the workmen, there would be no question as to whether or not the men would accept instruction and obey orders.

One reason often heard for carelessness is that the men are indifferent to being hurt. The fact is, however, that they are either ignorant of many of the hazards with which they are confronted, or through familiarity, lose their respect for them.

In visiting ships and talking to longshoremen about unsafe acts, we find that they almost invariably change the subject to unsafe gear. As one points out the possibility of a strongback at their feet being tipped over as a slingload bumps against it, they will kick it with their foot and say, "Oh, why worry about little things like this? That strongback won't tip over. But why don't you go and look at the gear on such and such a ship?" Often one will find a ship that is really in quite a bad condition in regard to gear. The men are complaining about it, but they are afraid of it, and therefore are always on guard against something carrying away. It may be that something does fail but, after the noise has quieted and the dust has cleared, it will be found that men will be crawling safely out of holes into which they had dropped at the first indication of danger. They are all conscious of the extreme hazard of unsafe gear, and are therefore extremely careful when they are forced to work with it.

On the other hand, the strongback on edge, the dunnage lying scattered about, the spaces between 'tween deck hatch covers, the dangers of mashing fingers on a drum or a case, the danger of falling into unguarded openings, or the possibility of something falling from a pile or a slingload does not impress them.

Then there is the group of men who get hurt on account of unsafe acts because they are not physically fit to do the job on account of:

1. Defective eyesight.
2. Defective hearing.
3. Poor health.
4. Worry over personal or family problems.
5. Poor mental balance.
6. Influence of alcohol.
7. Old age.

Another group includes those workmen who deliberately take chances to:

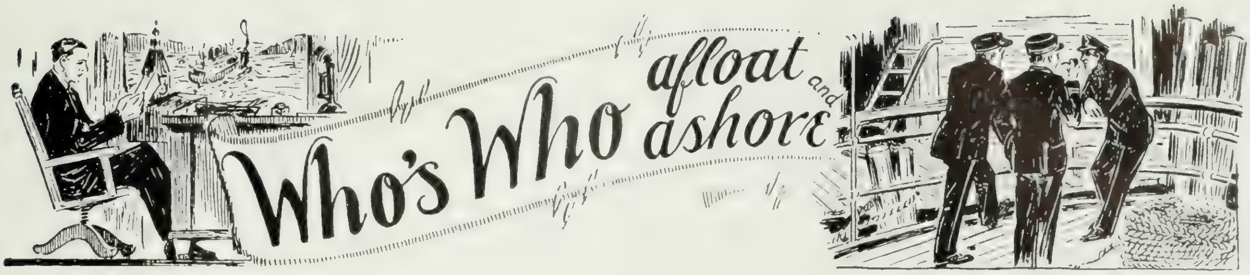
1. Show bravado.
2. Defy or show up the boss.
3. Show contempt for rules or regulations.
4. Get by with less effort (laziness).
5. Satisfy an uncontrollable desire to take short cuts.

But chance-taking, short cuts, carelessness, and thoughtlessness by even the best and normal workmen, are very largely due to the perfectly natural influence brought about by:

1. Poor housekeeping, dirt, disorder, unshipshape conditions.
2. Other conditions of working places, such as insufficient light, poor tools, unguarded openings and machinery.
3. Bawling out by boss in front of other members of gang.
4. Improper clothing.
5. Lack of cordial relations among the gang members, brought about by jealousy, teacher's pet, etc.
6. Mental distractions due to congestion, confusion, noise, other men talking or arguing, injury to some member of the gang, being harassed, scolded, hurried or disorganized.
7. Ignorance and nervousness on account of not being properly instructed.
8. Laxity of supervisors in correcting hazardous conditions which the men seek to have corrected.

But the most important cures for "carelessness" are good, clean, orderly, well-lighted, guarded working places, gang harmony, safety clothing, and an intelligent, understanding boss who sets a good example, makes himself liked and respected by his men, and who takes time to teach and help his men to work without accidents.

Address before Marine Section, National Safety Congress, Chicago, October 7th, 1941.


Who's Who afloat and ashore

Edited by Jerry E. Scanlon

New Bar Pilot

General approval was expressed over the appointment last month by Governor Olson of Captain Konrad "Ken" Hubbenette as San Francisco Bar Pilot.

The well-known skipper of Matson Steamship Company vessels assumed his new duties after the Governor's announcement of his appointment.

In his capacity as captain and relief master, he has commanded virtually every type of ship under the flag of the Matson Navigation Company. He joined the company some 30 years ago as an able-bodied seaman aboard the steamer Hilonian.

However, before he entered "steam" he served his apprenticeship as a deck boy and then up through the ranks on sailing ships under the Swedish flag. Shortly after he was with Matson, his outstanding ability in seamanship was recognized and it was not long before he was promoted quartermaster, third, second, first, chief mate and then skipper. His first command came as a Christmas present in 1920, when he was named master of the old steamer Lurline.

In addition to his capability as a mariner, Captain Hubbenette as a younger man was an athlete of no mean distinction as a runner, swimmer and diving expert. He won the Pacific Northwest-Canadian marathon run in 1909, and while a member of the Olympic Club was a noted swimmer, diver and wrestler.

His son, Raymond, is at present a cadet on the liner Matsonia under Captain Frank Johnson.

* * *

Captain F. P. Willarts is now master of the steamer Ruth Alexander.

Men and Ships

When the new C-3-P, passenger and freight liner President Polk, seventh and last of the fleet built for the American President Lines, came into San Francisco, Captain Frank Dutton was on the bridge. He was formerly skipper of the Ruth Alexander. Chief Officer is W. T. Johnson.

George Jackson, formerly chief engineer of the President Hayes, is the head of the propulsion department and his first assistant is Fred Jennings.

* * *

The Alcoa Puritan, built at the Union Plant of Bethlehem and now down at South America discharging Pacific Coast commodities for Grace Line, sailed from here in command of Captain K. G. Landberg.

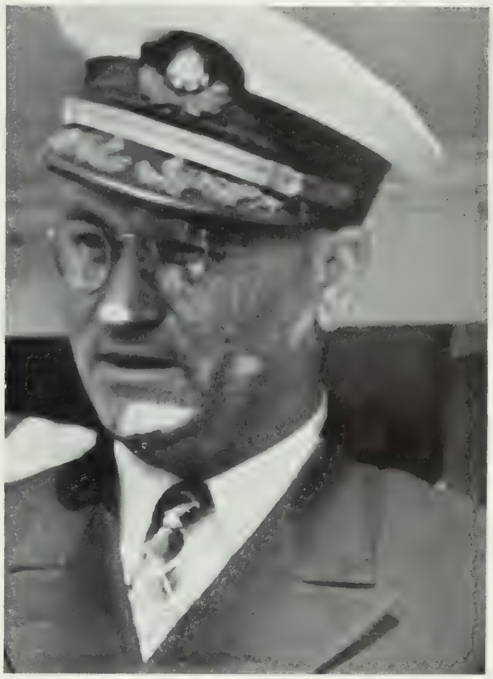
* * *

In command of the steamer Day Star, which was assigned the American President Lines by the Maritime Commission, is Captain D. E. Collins, formerly master of the steamer President Hayes. The Day Star is a former Danish ship taken over by the Government.

* * *

Commander of the brand new motorship American Packer is Captain L. B. Adams. He is a veteran of the United States Lines, for which this vessel was commissioned, having been in succession a navigator and master of their vessels for the last quarter of a century.

The ship having been built at the Western Pipe & Steel ways, Captain Adams had been here in connection with building details of the vessel for some months. During this period he became well acquainted and popular.



Capt. Konrad Hubbenette

Expansion

Expansion of operations since being appointed California agents for Quaker Line, California-Eastern Line, and States Line, De La Rama Line has leased new quarters in the Alaska Commercial Building, San Francisco, as of November 1. Their offices have been in the Merchant's Exchange Building.

The De La Rama interests has also secured from the State Board of Harbor Commissioners the assignment of pier 9, in San Francisco. Heretofore, the line has had use of pier 39 on a cooperative basis with Williams, Dimond & Co. The new agency arrangement becomes effective December 1.

Harry Thompson

Traffic Exec Grace Line

Harry Thompson, now traffic manager on the Pacific Coast for the Grace Line, with headquarters in San Francisco, started his shipping career as an office boy with W. R. Grace & Co., some twenty-five years ago in the local headquarters.

However, he has been in and out of San Francisco offices to far places of the world for the company, and also as a soldier. He has been in his present post since September 1939, but his numerous assignments with the company assure him of no permanency. One thing is certain; Harry has a record of accomplishing whatever tasks are assigned.

He was born February 1, 1898, in Liverpool, but came to the United States at the age of four. He entered W. R. Grace & Co., San Francisco, in 1914. In 1917, Harry was in the army as a private, then made a second lieutenant's commission and was sent overseas.

Back from the war, Edward T. Ford, now retired vice president, sent Harry to the Orient as representative in Indo China, Japan, China and Siam.

After eight years he came back to "The States" and was named assistant manager under W. D. Vanderbilt in Seattle. In 1934, with the big "Santa ships" running, Harry was again changed. He went to Los Angeles under the late Clay Hutchison as assistant manager in the Los Angeles offices. When the "Santa ships" were taken out of the coast-to-coast service, Harry went back to Seattle where he remained until ordered to his present berth in San Francisco in 1939.

His hobby is fishing and hunting.

New Commands

Captain T. H. Cunningham has taken the place of W. H. Turnquist on the steamer Kaimoku.

The liner Lurline now is in command of Captain C. A. Berndston; vice, Henry Gillispie.

Captain of the S. S. Perida is now J. P. Kristensen, who relieved Chris Olson.

On the bridge of the S. S. Olpana is Captain M. E. Stone, who succeeded Captain S. King.

Captain R. V. Tillett was ordered to take command of the steamer Lihue; vice, K. L. Svinding.

OPM Visitor

On his first trip to California since his appointment to OPM, Floyd B. Odlum, director of OPM's Division of Contract Distribution, plans to attend the National Defense Production Clinic in Los Angeles on November 17 and 18. If possible, he will meet with defense officials in San Francisco on November 21, according to the Western area manager of the division, Colonel Frank M. Smith.

* * *

William (Bill) Reagh, member of the Passenger Department of the American President Lines, Los Angeles, has been named purser of the motorship Day Star. This vessel was the former Danish motorship Laura Maersk and is now in the California-Orient service.

Lieut. Stanley E. Allen

Stan Allen To Navy

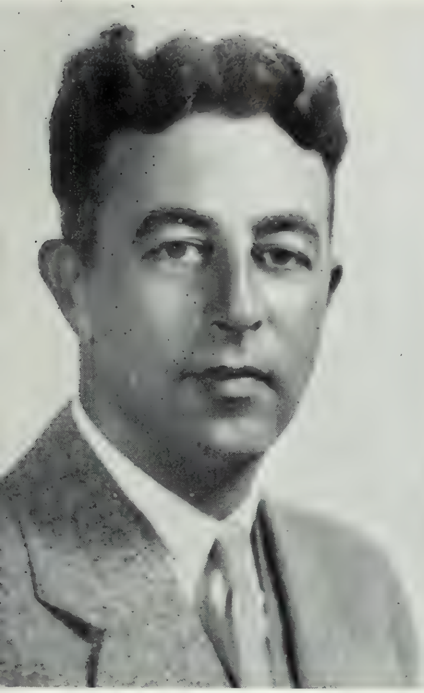
The Navy called Captain Stanley E. (SEA) Allen into service early this month, and the popular executive of the marine department of the Standard Oil Company is now Lieutenant Allen at present in Washington with Puerto Rico scheduled as his headquarters, for the next several months at least.

Uncle Sam's summons came in such haste that fellow associates of the S. O. and the members of the Mariners Club, of which Lieutenant Allen served for long as secretary, were forestalled in arranging a bon voyage party.

* * *

Fred Parr, president of the Parr-Richmond Terminal Corporation of Richmond, California, left October 31 for Washington, D. C., to engage in conferences for both personal business and for matters concerning the Contra Costa Development Company, of which he is chairman of the executive committee.

He plans to return around the middle of November.



Malcolm E. Crossman

Malcolm E. Crossman

One of the popular figures of the younger executives during the Propeller Club's national gathering was Malcolm E. Crossman, District Cadet Training Instructor for the U. S. Maritime Commission at Treasure Island.

Since Mr. Crossman is destined to become an important leader in this country's development of the training of officers for the American Merchant Marine, we hasten to give our readers a brief biography of Instructor Crossman's career:

Born in 1904, Taunton, Mass., he graduated from the Massachusetts Nautical Schoolship U. S. S. Nantucket in 1925. From 1925 to 1931 he sailed as deck officer in various types of merchant ships.

From 1931 to 1934 he was Executive Officer of the California Maritime Academy schoolship California State, and was in Operating Department of the McCormick Steamship Company from 1935 to 1940. January of last year he was appointed District Cadet Training Instructor for the U. S. Maritime Commission, Pacific Coast District.

He holds commission in U. S. Naval Reserve as Lieutenant Commander, together with third issue of Master's License Unlimited, and pilot licenses.

USMC Agent Recovers

Captain James Irvine, Port Agent in Los Angeles harbor for the Maritime Commission, has recovered sufficently from injuries suffered in an automobile accident, that claimed the lives of his wife and daughter, to be in his office part of the time, as we go to press.

One of the best known marine men in this area, Captain Irvine was driving in Mexico City, preparatory to coming to Los Angeles to assume his new duties when the accident happened.

Marine men recall that Captain Irvine was in charge of conversion of British war vessels to merchant carriers for two years after World War No. 1, at Southampton and Portsmouth, England. From 1922 to 1926 he was vice president and general manager of the Mexican State Steamship Line, which operated passenger and freight vessels between San Francisco and Mexico. Later he served as vice president and general manager of the Mexican Mail Steamship Company, operating the vessels Sonora and Sinaloa between the Golden Gate and Mexico. He had been head of the Marine Department of the Petrol Corporation with Los Angeles headquarters until his recent Maritime Commission appointment.

More About Lloyd Swayne

Appointment of Lloyd Swayne to the post of Pacific Coast coordinator for the United States Maritime Commission's Division of Emergency Shipping, was well received by all marine interests on the West Coast.

The Division of Emergency Shipping is similar to the Emergency Fleet Corporation of World War Days. Until Swayne's appointment, there was no Pacific Coast representation, the unit being composed of men in Atlantic and Gulf ports.

Lloyd Swayne is by experience and background eminently fitted for this responsible position. He is a member of a pioneer shipping family. His father was one of the co-founders of the firm of Swayne & Hoyt, whose sailing ships, steam schooners and steamers have played important parts in the history of the development of the American Merchant Marine.

Reared in a maritime atmosphere, Lloyd Swayne has a keen insight and varied experience in ship operations that will serve him well in his new post.

* * *

William A. "Bill" Young, one of the country's well-known steamship passenger executives, is now occupying an important post with the General Engineering & Drydock Company.

For years Young served as passenger head of the old Pacific Mail, then with the Panama Mail, and, until his retirement six years ago, was passenger traffic manager of the Grace Line.

* * *

James E. McLaughlin, who was purser on the S. S. Flying Cloud, has taken the same post on the S. S. Alcoa Patriot.

News of Capt. King Zeeder

From out of the shroud that has covered the activities of much of the gay centers of Europe, word has been received that one of the Pacific's best-known figures, Captain Adrian "King" Zeeder is safe and sound in his villa near Monaco.

A. M. Garland, who was manager of the old China Mail Steamship Co., and one of California Street's best-known figures, and of the school of R. P. Schwerin, V. C. M. "Pop" Comfort, Captain Robert Dollar, Captain Ryland Drennan, Captain J. H. Rinder, and hundreds of others living and others now dead who made Pacific shipping history, received a letter from Captain Zeeder that "All was well" under present circumstances.

Mr. Garland's information reported the death of Captain Zeeder's sister in an automobile crash in Monaco. He said that he planned to leave Europe as soon as he could secure release of funds and come to San Francisco.

Captain Zeeder was master of such well-known liners as the Manchuria and the Mongolia, when these vessels operated for the old Pacific Mail Steamship Company in the transpacific trade.

In the Wake of the Propeller Convention

Success of the reception given to Admiral E. S. Land, Captain Howard Vickery, Mark O'Dea and other Maritime Commission executives while attending the Propeller Club convention was in no small measure due to the fine cooperation of E. C. Mausshardt, District Manager on the Pacific Coast for the Commission.

Warm in their praise are the shipbuilders and shipping interests of the ever-readiness of Mr. Mausshardt to help solve difficult problems and these sentiments were duly expressed to Admiral Land and his "aides."

* * *

Captain Frank Leahy, U. S. supervising inspector of hulls and boilers, returned home with Mrs. Leahy to New Orleans, after attending the Propeller Club meet in San Francisco. While on the Coast, Captain Leahy was guest of Captain William Fisher of the San Francisco office.

San Francisco is Captain Leahy's home and three years ago he spent twelve months in his home-town port, then went to Louisiana to his present post.

* * *

The consensus expressed from a cross-section of persons in a position to know was to the effect that the Fifteenth Annual Convention of the Propeller Club of the United States and the American Merchant Marine Conference, held in San Francisco at the Hotel Fairmont from October 21 to 24, was a gathering, without fear of contradiction, the finest and most successful convention ever held by any organization or fraternity in this city's history.

We could quote from high Government, civic and business leaders if we wished, but believe that the sentiments expressed by the Hotel Fairmont management down to the page boys is sufficient:

"The most considerate, courteous group of men and women we have ever entertained in our hotel."

Harry W. Parsons

Harry W. Parsons of the Foster-Wheeler Corporation, who came to attend the Fifteenth National Convention of the Propeller Club of the United States as a delegate, and who is past president of the organization, left for his New York home the middle of October, fully recovered from the serious illness that forced him to take to his bed and miss the entire conclave.

* * *

West Coast yards are emulating their records of World War No. 1, and the high scores are yet to come.

Captain Howard Vickery of the U. S. Maritime Commission, made the statement, while in San Francisco at the Propeller Club's national convention, that the shipbuilding records to date had been broken by Todd-California Shipbuilding Corporation of Richmond in completing construction of the S.S. Ocean Vanguard in six months, 11 days between keel laying and delivery.

The accomplishment is more than a month faster than the fastest construction of any freighter during the World War period Captain Vickery, chief of the commission construction, states.

Capt. R. W. Tucker

Oregon's steamship fraternity may well be proud of the manner in which their Propeller Club officials handled their part in the national convention of the Propeller Club in San Francisco.

Phil Thurmond

Phil Thurmond, whose private business is confined to promoting foreign trade business for Pope & Talbot, along with Charles Spear, president of the Portland Propeller Club, Vice-President Captain R. W. Tucker and E. E. Munly, treasurer, were warmly complimented by Edward H. Harms, general convention chairman, for their friendly and helpful cooperation prior to and during the period of the conclave.

E. F. Munly

Don Watson

Gradually but steadily mounting the ladder of success among the younger executives of the marine world is Donald "Don" Watson, manager of the Pacific Coast Direct Line.

Graduated from the University of California, "Don" had been associated with Interocean Line since 1933, until a change was made; and, in April of this year, he was appointed to his present post by L. C. Howard, president.

During the Propeller Club's national meeting, "Don" served as vice chairman of the Registration Committee, and then, when K. C. Tripp was forced by pressure of duties to surrender his post, Mr. Watson took charge.

"Don" holds a lieutenant's commission in the United States Navy. He is unmarried, but reports indicate that his status will be changed within a reasonable time.

Donald Watson

New Westinghouse Steam Engineer

William H. Sullivan, steam engineer for the Westinghouse Electric & Manufacturing Co. at Philadelphia, Pa., for the past five years, has been named steam engineer for the company's Pacific Coast District with headquarters in San Francisco. Announcement of the appointment was made recently by Chas. A. Dostal, Pacific Coast district manager, and A. W. Copley, Pacific Coast Engineering and Service manager.

In his new post, Mr. Sullivan will be active on all negotiations involving steam turbines for land and marine uses. His territory as a consultant will comprise the entire Pacific Coast territory of the company.

A native of Springfield, Ill., Mr. Sullivan graduated in 1934 from the University of Colorado at Boulder, Colo., with the degree of Bachelor of Science in Electric Engineering. He is a member of Delta Tau Delta fraternity.

He joined Westinghouse in January, 1936, at East Pittsburgh, Pa. A year later he was transferred to the company's South Philadelphia, Pa., turbine works, where steam turbines and associated equipment for land and marine uses are manufactured.

Wm. H. Sullivan

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Retirement of P. V. G. Mitchell, vice president of the International Mercantile Marine, parent firm of the U. S. Lines, was made head of the passenger department in October. Although New York was his headquarters, the news of Mr. Mitchell's retirement was made known while he was in San Francisco attending the Propeller Club convention.

* * *

The American-Hawaiian Steamship Company's freighter Iowan will be back in service by the middle of December, officials announce. The Iowan, at Moore Dry Dock Company, is undergoing a $500,000 repair job for damages sustained when she went ashore on the Southern California coast in a dense fog while en route to San Francisco from New York.

Virtually the entire bottom of the Iowan was renewed and many of her plates had to be re-rolled and re-fitted.

* * *

Harvey Street, veteran in point of American President Lines service, is the purser on the new liner President Polk.

* * *

Oliver H. Martin, who was with the McCormick Steamship Company, has been called to duty with the rank of ensign and is now in Washington attached to the office of the Chief of Naval Operations.

Ship leaders will recall Ensign Martin as being associated with Edward H. Harms, general chairman of the Propeller Club of the United States national convention.

* * *

Due to arrive at the Pacific Coast on November 10 is the steamer Siletz for the Grace Line's "B" service. This vessel had been running out of New York for the company to South America, but was shifted to this range under agreement with the Maritime Commission. She is one of the Shipping Board vessels of 8800 tons, but, unlike some of the other arrangements, has been permanently assigned to the West Coast.

Launching

Joseph A. Moore (standing) is complimented for the novel idea of staging the reception held after the launching of the Alcoa Courier aboard the good old ferryboat Santa Clara, which was berthed at the Moore Shipyard for the occasion. Invited guests enjoyed the entertainment presented by Charles Bulotti, Austin Sperry, Rudy Sieger and Roy Folger. Short talks were made by U. S. M. C. Commissioner Capt. Vickery, J. Lewis Luckenbach and Mr. Moore

Women's Organization for Merchant Marine

Urging by resolution that the United States Maritime Commission **"call together at Washington, D. C., a group composed of educators and business leaders to confer on subjects pertinent to the American Merchant Marine,"** the Women's Organization for the American Merchant Marine, Inc., adjourned their national convention in San Francisco late in October.

The Women's Organization met in conjunction with the fifteenth annual convention of the Propeller Club of the United States and the American Merchant Marine Conference, which attracted hundreds of top-flight shipping executives and Government men interested in shipping and foreign trade.

Presiding over the Women's Organization meeting was Mrs. Benn Barber of New York, president. In attendance were Mrs. Arthur M. Tode, wife of the honorary president and founder of the Propeller Club of the United States; Mrs. Lewis Luckenbach of New York; Mrs. Charles L. Wheeler, wife of the president of the San Francisco Propeller Club, and one hundred other ladies, most of them wives of prominent shipping executives.

The subjects named in the resolution which were deemed "pertinent to the American Merchant Marine" were: (1) Education of the general public to the needs of the Merchant Marine, (2) the recruiting and training of desirable maritime personnel, and (3) the building up of present and postwar foreign trade.

The ladies adjourned without selecting a site for the 1942 convention, it being decided to await the action of the national board of directors of the Propeller Club of the United States, which have until March 1 to select a city for next year's convention. The Women's Organization, although not officially an auxiliary of the Propeller Club and Merchant Marine Conference, always hold their convention in conjunction with the men's convention.

E. J. Bradley, Pacific Coast representative of the Division of Emergency Shipping, quick-tripped to Washington, D. C., on October 11 and was back at his desk on October 16 at San Francisco.

Navy Day

Observing Navy Day in San Francisco, several Maritime groups were co-sponsors of the luncheon at the Fairmont Hotel. Our photo, taken by staff photographer Sponagle, shows (left) Erik Krag, representing The Mariners Club, Walter J. Walsh, chairman of the Navy League, Rear Admiral J. W. Greenslade, U. S. N., Capt. Jas. A. Alger, Western Inspector, U. S. Coast Guard

Ladies of the Convention and Conference

Mrs. Benn Barber chosen to lead the Women's Organization for the American Merchant Marine

Mrs. O. B. Whittaker
Mrs. J. F. McConkey

Mrs. J. Lewis Luckenbach
Mrs. Hugh Gallagher

Mrs. Harry Parson
Mrs. Chas. L. Wheeler

Mrs. Benn Barber
Mrs. Thos. E. Egan

Mrs. Frazer A. Bailey
Mrs. Frank Leahy
Mrs. A. M. Eisig

Mrs. Geo. A. Pope, Jr.

Walter Parrish Appointed

The National Supply Company announces the appointment of Walter A. Parrish as executive engineer of the Superior Engine Division, with headquarters at the Springfield, Ohio, plant.

Mr. Parrish was born in Detroit, Mich., and attended grade and high schools in that city, graduating from the Detroit Technical Institute in 1910. Since that time practically his entire work has been with internal combustion engines, and his service record is replete with names of companies famous in automobile history—Ford, Hudson, Maxwell, Lozier, Continental Engine, Packard, and others. While with Hudson he was associated with Howard E. Coffin, one of the immortals in automotive design; with Packard he did special work with E. H. Belden on their famous 12-cylinder racing car engine, as well as service engineering and in the truck division. In 1916 he was in service on the Mexican border with the 31st Michigan Infantry; after his return he was with the International Harvester Experimental Works at Chicago, later being transferred to the truck plant in Akron, where he was chief draftsman.

From 1919 'till 1922 he was chief engineer for the Akron Motor Truck Company, where he was responsible for one of the earliest developments of a high-speed, 1½-ton truck running on pneumatic tires. In 1922 he joined Hercules Motors Corporation at Canton as engine designer, and in 1927 went to White Motors at Cleveland in the same capacity.

For ten years he was engine designer, assistant chief engineer and chief engineer for The Buda Engine Company at Harvey, Ill., followed by one year with Caterpillar Tractor Company as engine designer.

In 1939 he joined the Cummins Engine Company at Columbus, Ind., as assistant chief engineer, serving in that capacity until his recent decision to accept this new position with the National Supply Company.

MATSON LINERS INSTALL RADIOTELEPHONES

Direct radio telephone service to and from the Matson liners was inaugurated aboard the liner S. S. Lurline recently, connecting the liner with telephone service to all parts of the world. Shown here is Miss Sybil Smith of Honolulu talking to her parents in the Islands as Commodore C. A. Berndtson, master of the Lurline, stands by. Matson liners are the first American ships on the Pacific to have this service

Navy Day Ball

The Twelfth Naval District Branch of the Navy League of the United States sponsored the resplendent Navy Ball held at the Fairmont Hotel in San Francisco on Saturday evening, October 25.

Honorary patrons and patronesses were: Rear Admiral John W. Greenslade, U. S. Navy, and Mrs. Greenslade; Rear Admiral W. L. Friedell, U. S. Navy, and Mrs. Friedell; Rear Admiral Hugo W. Osterhaus, U. S. Navy, Ret., and Mrs. Osterhaus; Captain Harry J. Abbett, U. S. Navy, and Mrs. Abbett; Captain Ross S. Culp, U. S. Navy, Ret., and Mrs. Culp; Captain Donald C. Godwin, U. S. Navy, and Mrs. Godwin; Captain Frank R. McCrary, U. S. Navy, Ret., and Mrs. McCrary; Major General Charles F. B. Price, U. S. M. C., and Mrs. Price; Major General Ernest D. Peek, U. S. Army, and Mrs. Peek; Major General Walter K. Wilson, U. S. Army, and Mrs. Wilson; Brigadier General Wallace DeWitt, U. S. Army, and Mrs. DeWitt; Brigadier General Arthur W. Lane, U. S. Army, and Mrs. Lane; Brigadier General John C. H. Lee, U. S. Army; Brigadier General Edward A. Stockton, Jr., U. S. Army, and Mrs. Stockton; Colonel Charles H. Corlett, Inf., U. S. Army, and Mrs. Corlett; Colonel Michael F. Davis, A. C., U. S. Army, and Mrs. Davis; Colonel Chas. H. Rice, Inf., U. S. Army, and Mrs. Rice; Colonel George L. Usher, A. C., U. S. Army, and Mrs. Usher; Lieutenant Colonel George Munteanu, Inf., U. S. Army, and Mrs. Munteanu.

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A new exhibit room for the San Francisco Museum of Science and Industry at Aquatic Park was previewed on October 23. The exhibits in this room include airplane and railroad models, as well as old shipping documents and photographs.

PMR on the job!

All visitors to the American Merchant Marine Conference sessions held in the Gold Ball Room of the Fairmont will remember **PACIFIC MARINE REVIEW's** *cozy booth, near the portals. From this vantage point a well-planned distribution of* **PMR's** *184-page October volume dedicated to the Convention-Conference placed complimentary copies into the hands of the distinguished visitors. In our photo can be seen reproductions of the magnificent October cover, which received many glowing tributes*

Personals

Captain R. Cross left San Francisco on October 2, where he was owner's representative of the British Silver Line, to fulfill the same position in New York, due to the company's diversion from Pacific to Atlantic operation.

The State Terminal Company, Ltd., was assigned the south side of Pier 9, San Francisco, effective October 18, by the Board of State Harbor Commissioners.

Harmon Lewis, president of the Alcoa Steamship Company, announced that a new office in Port of Spain, Trinidad, had been opened in October and that all of the company's business in Trinidad would be herein centralized.

He also stated that his company has resumed regular sailing schedules of various services from New York, Mobile and New Orleans on October 3, with four vessels.

M. F. York Goes To New York

Miles F. York, who has been ocean marine underwriter at the head office of Fireman's Fund Insurance Company (San Francisco) for some years, has been appointed assistant manager of the Atlantic Marine Department of the Fireman's Fund Group in New York City. He will assume his new duties sometime after the first of next year.

Mr. York's appointment strengthens the New York City staff, which is under the management of Frederick B. McBride, with John H. McKinney and H. E. Reed as assistant managers. This office, exercising direct supervision throughout the Atlantic, New England and Southern states, is regarded as one of the leading marine and inland marine departments in the Atlantic Coast states.

Lloyd Swayne New Pacific Coast Coordinator of Emergency Shipping

Captain Howard Vickery, of the U. S. Maritime Commission, in San Francisco for the opening of the Propeller Club convention, announced on October 20 the appointment of Lloyd Swayne as Pacific Coast coordinator of the Division of Emergency.

Admiral Land, also in San Francisco attending the Propeller meet, stated that Mr. Swayne was chosen not because he was a West Coast man, but because "we knew he is a shipping man of outstanding experience, with a knowledge of East Coast as well as West Coast shipping conditions."

That Mr. Swayne knows the industry and its problems is evidenced by his long service as president of Swayne & Hoyt Steamship Company, until it was discontinued last year. Just recently he acquired an interest in the Kellogg Express Co., San Francisco, where he has become acquainted with trucking as related to the total transportation problem of national defense.

Shipping men of the Pacific Coast were not only highly pleased that a Pacific Coast man was selected, but were almost unanimous in their praise of Mr. Swayne as the man most qualified because of his understanding of both the requirements of private ownership and the labor situation along the Pacific Coast.

Dr. Grady Returns

After returning from the Far East on a government mission, Henry F. Grady was honored at a joint luncheon in San Francisco of the Commonwealth Club and the Foreign Trade Association on October 20. Dr. Grady's Far East trip was for the purpose of increasing the efficiency in the flow of essential raw materials to American defense industry.

Adams Visits Us

R. Ranney Adams, executive vice-president of the Grace Line, made his first trip of inspection of the company's Pacific Coast terminals late in October, following his attendance at the Propeller Club convention. He was accompanied on his tour of Coast ports by Fred L. Doelker, Grace vice-president in the West Coast district.

On the trial trip of the American Packer . . . these compass adjusters are seen . . . after the job is completed. They are Maxwell Orrish, of the George Butler Company, San Francisco dealers in nautical instruments; Lieut. John Blackburn, U. S. N. R., and Capt. L. A. Spaulding

Trade Conference Clicks!

So successful was the Pacific Coast Trade Conference, held in San Francisco in September, that a committee was formed to make it permanent. The chairman is L. W. Hartman, prominent foreign trader and president of J. T. Steeb & Co., of Portland, Ore.

Mr. Hartman called the committee to their first meeting, in Portland, the last part of October. The committee included: Richard S. Turner, San Francisco, general chairman of the Pacific Coast Trade Conference, and past president of the Foreign Trade Association of the San Francisco Chamber of Commerce; R. A. Mitchell, Los Angeles, president of the Foreign Trade Association of Southern California; Phil Thurmond, Portland, manager of the Portland Chamber, Maritime Commerce Department; William L. Montgomery, San Francisco, manager of the International Trade Department of the San Francisco Chamber; P. A. Hoyt, chairman of the Oakland Chamber, Foreign Trade Committee; George A. Jensen, of the George A. Jensen Company, Seattle, Wash.; Stanley T. Olafson, assistant manager of the Los Angeles Chamber, Department of Foreign Commerce and Shipping; John A. Sowers, manager of the Oakland Chamber, Department of Foreign and Domestic Commerce; Dean D. Ballard, manager of the Seattle Chamber, Foreign Trade Department.

◆

McCormick Steamship Company's new district manager in Seattle, Wash., is E. J. Barrington, formerly stationed in Portland, Ore., for several years. He replaced John G. Nordgren, resigned.

To New York For Trade Meet

Among the San Franciscans who attended the National Foreign Trade Convention at New York City on October 6, 7, and 8, were the following: W. F. Minehan, Bank of America; Lester Goodman, Getz Bros. & Co.; Peter A. Kinnoch, American Trust Company; Drew Chidester, executive vice-president of General Steamship Company; and William Montgomery, manager of the International Foreign Trade Department of the San Francisco Chamber of Commerce.

After the meet, Mr. Montgomery visited government agencies regarding matters brought up by resolutions passed at the recent Pacific Coast Trade Conference, held in San Francisco.

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In the middle of October, Antonio Madrigal, son of Vincente Madrigal, owner of the Madrigal Line, was in San Francisco, where he made his headquarters for a few days at the line's offices in the Merchants Exchange Building. While there he conferred with C. U. Martin, San Francisco representative for the Madrigal interests since 1918.

He left shortly thereafter for Cleveland, where he was scheduled to inspect the 5,000-ton Great Lakes bulk carrier Tristan, to be used in the Madrigal Lines coal service.

◆

With two retirements and a full life of activity and naval adventure, **Rear Admiral Newton E. Mason, U. S. N., Ret.,** reached his 91st year on October 14. Conceded to be the oldest living graduate of the U. S. Naval Academy at Annapolis, Admiral Mason was graduated in 1869.

In 1880, he saw duty on the Constitution, the Irish famine relief ship. For his valiant service aboard the U. S. S. Brooklyn during the Spanish-American War, he was awarded the Santiago Medal.

His first retirement, in 1912, lasted only until 1917, when the Government called him to duty in the Ordnance Department in Washington, D. C. His final retirement came in 1919. He is now living at Coronado, Calif.

At Moore Shipyard

It was planned, as we went to press, for Fulton Lewis, Jr., famous news analyst and commentator, to interview the employees and officials of Moore Dry Dock Company in Oakland on November 4 at 7:30 p. m. The program, which will be "aired" over 127 stations of the Mutual Broadcasting System, is one in a series of "Your Defense Reporter" broadcasts.

On November 10, Mr. Lewis will do his interviewing at the Union Oil Company, Los Angeles, same time.

Port of Tacoma

An enthusiastic membership was on hand at the October dinner and meeting of the Propeller Club, Port of Tacoma, which was held at the University-Union Club on Tuesday, the 21st.

Fifty-nine members and guests, the largest number at a meeting of the Tacoma Propeller Club, enjoyed a very fine dinner and a particularly interesting address by Sub-Lieutenant C. Halliday of H. M. S. Warspite, which is now undergoing extensive repairs at the Bremerton Navy Yard.

The lieutenant gave a thrilling description of his experiences in the Mediterranean Sea during engagements with the Italian Navy and also of skirmishes in a Norwegian harbor.

Previous to the main talk, Charles Cramp was asked by President Gil Ackerman to read two letters, one from our treasurer, Henry Dufour, addressed to Perry Moore, and the answering letter from Mr. Moore to Mr. Dufour. The letters were in connection with Mr. Moore's visit to San Francisco as our official delegate to the national convention, and were in a very humorous vein.

Phil Gruger was asked to give a report on the progress of the ticket sale which is to be held in the interests of the Tacoma Sea Scouts' boat, the "Albatross." Gruger stated that tickets would be printed and passed to various members to be sold for 50 cents each, all proceeds over and above the prizes to be given to the Sea Scouts to be used to help in completion of their boat.

New members to report are as follows:

P. N. Mulvany, U. S. Maritime Commission, c/o Seattle-Tacoma Shipbuilding Corporation.

George H. Osgood, Northwest Machine Works, 601 East Eleventh Street.

H. S. Baarslag, Jr., Seattle-Tacoma Shipbuilding Corporation.

Ed F. Thieler, Jr., Seattle-Tacoma Shipbuilding Corporation.

The meeting was adjourned by President Gil after the main address.

Two Argentine guests, Carlos Anesi and Lopez Fugoni, attended a luncheon meeting of the Foreign Trade Association, San Francisco, on October 6. Both are prominent in Argentine travel circles, the former as president of the National Automobile Club of the Argentine Republic, the latter as director of the National Roads Board of Argentina.

The Maritime Commission announced in October the appointment of **Philip E. McIntyre** of the New York office of the United States Lines as assistant to **A. W. Parry** in the Division of Operations and Traffic, concerned with the regulation of rates and charters.

Henry G. Bartlett, formerly business manager for the Japanese shipping firm, Mitsubishi, in Los Angeles, was appointed West Coast shipping adviser to the Office of Production Management in October.

About sixty excited youngsters, members of 4-H clubs, visited the Matson liner Lurline on October 15 as the highlight of the program of the City and County of San Francisco in cultivating and improving relations between the hinterland and San Francisco. The members of the group, who came from five Northern California counties, were also shown port operations on the wharf, in the warehouse and of ship stowage.

The expanding De La Rama Steamship Co., Inc., finding it necessary to have larger quarters for their San Francisco office, moved into the sixth floor of the Alaska Commercial Building the first part of November. Simultaneously, Pier 9, on San Francisco's waterfront, was assigned to the company by the State Harbor Commission.

Immediate expansion needs were caused by the addition of four American-owned, Panamanian flag vessels to its former fleet of five vessels.

In addition, the line will take over the California agencies of the Quaker and States lines on December 1, according to present plans.

A similar expansion was also carried out at Long Beach, where the company acquired its own pier with a frontage of over 600 feet.

As the line's principal operations are between California, Hongkong and the Philippine Islands, their cargoes of copra, sugar and ores have been greatly increased by national defense.

In the San Francisco office are: G. P. Bradford, assistant manager-director; H. H. Pierson, Pacific Coast manager; Harold Norton, assistant manager; D. C. McFadden, cashier; and Elmer Hult, chief clerk.

W. C. Ricks will superintend the Long Beach terminal.

M. A. Cremer, secretary-manager of the San Francisco Marine Exchange, announced that by October 15 the Exchange had added 31 new members. Among these were the following firms: Columbia Steel Company, Golden Gate Terminals, Charles de B. Haseltine, representing Pacific Stevedoring and Ballasting Company; Marine Electric Company, Norwegian Shipping and Trade Mission, Pacific Coast Shipbuilding School, Geo. E. Swett & Co., Western Pipe and Steel Company, and Western Terminal Company.

Via sound-color motion pictures, the members of the San Francisco Junior Foreign Trade Association went "By Air to Alaska" at their regular meeting on October 15, when the picture of that title was presented by the Pan-American Airways to introduce their new route to Alaska.

J. M. Post

The election of John A. O'Brien to the post of vice president of Johns-Manville Sales Corporation was announced on October 1 by Lewis H. Brown, president of Johns-Manville.

Mr. O'Brien will continue his duties as general sales manager of the power products and industrial department, a post he has held since 1938. He is a member of the J-M Quarter Century Club, having begun his career with the company in 1915, and is a member of the Engineers Club, New York.

Change of Masters

American steamer George L. Olson: D. N. Nilson, vice O. J. Johnson.

Steamer Mexican: C. H. Brunn, vice J. H. Gries.

Steamer Ruth Alexander: F. P. Willerts, vice D. Dulton.

American steamer Barbara C. M.: H. Banke, vice J. Swenson.

Steamer President Grant: W. S. Tyrell, vice G. Cullen.

American steamer American Packer: L. B. Adams, vice J. Twey.

* * *

After a prolonged stay in the East, Farnham P. Griffiths, president of the Marine Exchange of the Port of San Francisco, returned to San Francisco early in October with a stop-over at Los Angeles.

Bill Chisholm Mourned

William D. Chisholm, one of the pioneer developers of the American merchant marine, died at Long Beach, Calif., on October 25.

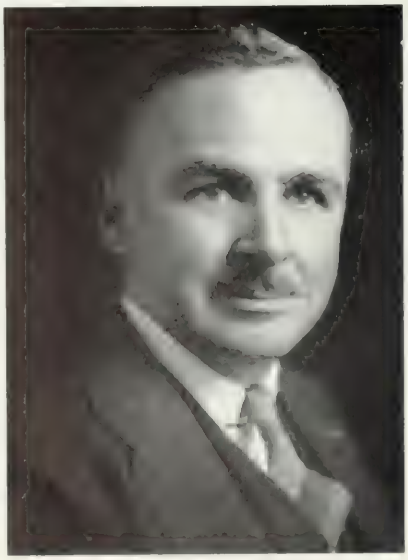
He had recently retired from the Richfield Oil Company as Southern California marine manager.

His career began in San Francisco with the Pacific Coast Steamship Company about the end of the '90s. He later joined the Pacific Mail, and, during the first World War, held a prominent position in the operation of ships with the U. S. Shipping Board, predecessor of the U. S. Maritime Commission.

Mr. Chisholm was assisted in the old Shipping Board days by E. C. Mausshardt, Pacific Coast manager for the Maritime Commission, who is one of many old-time friends who mourn his death.

John A. O'Brien, vice president, Johns-Manville Sales Corporation

M. L. Patterson, newly appointed General Sales Manager of The Sperry Gyroscope Co.



E. C. Sparling, newly appointed Chief Engineer, The Sperry Gyroscope Co.

Sperry Appoints

R. E. Gillmor, president of The Sperry Gyroscope Company, Inc., announced the appointment of E. C. Sparling as chief engineer and M. L. Patterson as general sales manager.

In explanation of the appointments, Mr. Gillmor stated that the very heavy development and manufacturing program of the company has made it necessary to divorce the administrative functions of the engineering and sales departments from the executive direction of those departments.

P. R. Bassett, vice president in charge of engineering, will retain the executive direction of all engineering activity, and the new chief engineer will relieve him of administrative duties.

R. B. Lea, vice president in charge of sales, will retain the executive direction of all sales activity, and the new general sales manager will relieve him of administrative duties.

At the same time Mr. Gillmor announced that due to the increased volume of work, the following promotions have been made: O. B. Whitaker, manager of the marine department, to marine sales manager; Stanley Bedell, manager of the export department, to export sales manager; F. B. Vose, manager of the aeronautical department, to aeronautical sales manager; E. F. Lazar, manager of aviation radio equipment, to manager of the Federal department; Paul FitzGerald to assistant manager of the Federal department.

Under the new sales division organization the marine sales manager, the export sales manager, the aeronautical sales manager, the manager of the Federal Department, and the manager of the Contracts Department, C. D. Jobson, will report to the general sales manager, who in turn will be responsible to the vice president in charge of sales, Mr. Lea. Among others continuing to report to the vice president in charge of sales is Arthur Weckel, who is in charge of service and school activities.

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Book Reviews

Aerosphere—1941, compiled by Aircraft Publications; edited by Glenn D. Angle; 950 pages, 8½" by 11½"; profusely illustrated; bound in blue cloth with silver stampings; published by Aircraft Publications. Price $10.00 net.

This monumental work "covers more important spheres of activity in the field of aviation throughout the world." It is the second edition of an annual, first published as Aerosphere —1939. There is a reduction in the number of pages as compared with 1939 due largely to omission of historical material on airplanes and airplane engines.

The book is divided into four sections as follows:

Section A covers, by countries, pictures and data on modern aircraft, international aircraft markings, and text covering airplane types in various services of the U. S. Government.

Section B covers, by countries, all types of modern aircraft engines with illustrations, data and specifications.

Section C presents commercial and military aircraft statistics.

Section D is a buyer's guide, presenting an alphabetical listing, by countries, of firms and organizations engaged in aircraft activities.

This publication should be invaluable to all who desire to keep informed on aircraft and their power plants. It is a beautiful job of printing and binding. Inside surface cover and facing flyleaf pages, front and back, present in colors the military plane markings of the principal nations.

Advanced Modern Navigation, by John Greenleaf; 250 five-by-eight-inch pages; bound in blue buckram, with white stampings; format designed by Merle Armitage; published by Longmans, Green and Company, New York. Net price $5.00.

This book is prefaced by Capt. R. E. Dobie of Dobie's Navigation and Engineering School, where John Greenleaf was for some time connected as an instructor in navigation.

The author avers of his book that it "is being introduced into an already popular field as a new approach to a subject that has already been thoroughly worked over along more conventional lines." His purpose is to provide a convenient text wherein can be found "every case likely to occur in the navigation of modern vessels," and to set forth "in a clear and understandable manner" the reasons behind each operation and solution.

Mathematically, this treatment of navigation concerns itself almost exclusively with the solutions of plane and spherical triangles, because the author is convinced that a thorough knowledge of triangles is basic for all navigation depending on "sights" and "fixes."

This book should be of great value to officers on board ship. It is a much more handy volume than most of the works on this subject. The explanations are terse and lucid, and the type is very readable.

Handling and Stowage of Cargo, by A. G. Ford; 225 five-by-eight-inch pages, profusely illustrated with diagrams and half tones; bound in blue buckram with gold stampings; published by the International Textbook Press, Scranton, Pa. Net price $2.25.

A very practical book by a shipmaster of long experience who is now associated with the Maritime Service as an instructor in Maritime Law and Cargo Handling. Captain Ford of the U. S. Merchant Marine holds a lieutenant's commission in the U. S. N. R., and also in the Maritime Training Service. When the author undertook his present responsibilities in training American Merchant Marine officers, no textbook could be found that adequately covered modern American practice in cargo handling. He therefore compiled a group of lectures on the subject, drawing upon all available literature, on ship operators, and on his own wide experience. Noting the effect of these lectures, the Maritime Service urged Capt. Ford to arrange them in a form suitable for publication.

The result is this book, and it is good. It covers the subject adequately in 12 chapters, filled with pertinent information set forth in a very interesting manner and illustrated with photographs of very recent handling operations.

General Electric Turbine Division Changes

Consolidation of the Mechanical Drive and Turbine-Generator Sections at General Electric's Lynn River Works has been announced by C. S. Coggeshall, manager of the company's Turbine Division. J. L. Kerr is named manager of sales of the consolidated Lynn section, with L. D. Whitescarver, formerly a turbine specialist in the company's Atlantic District, as general assistant.

Statement of Ownership

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACTS OF CONGRESS OF AUGUST 24, 1912, AND MARCH 3, 1933

Of PACIFIC MARINE REVIEW, published monthly at San Francisco, California, for October 1, 1941.
State of California, County of San Francisco.

Before me, a notary in and for the State and county aforesaid, personally appeared BERNARD N. DeROCHIE, who, having been duly sworn according to law, deposes and says that he is the Business Manager of the PACIFIC MARINE REVIEW and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher, JAMES S. HINES, 500 Sansome Street, San Francisco.
Editor, ALEX J. DICKIE, 1036 Mariposa Ave., Berkeley.
Managing Editor ——.
Business Managers, Bernard N. DeRochie, 500 Sansome Street, San Francisco.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.)

JAMES S. HINES, Owner.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.)

None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

B. N. DEROCHIE,
Business Manager.

Sworn to and subscribed before me this 24th day of September, 1941.

EDITH GOEWEY,
(SEAL) Notary Public in and for the City and County of San Francisco, State of California.

(My commission expires December 23, 1944.)

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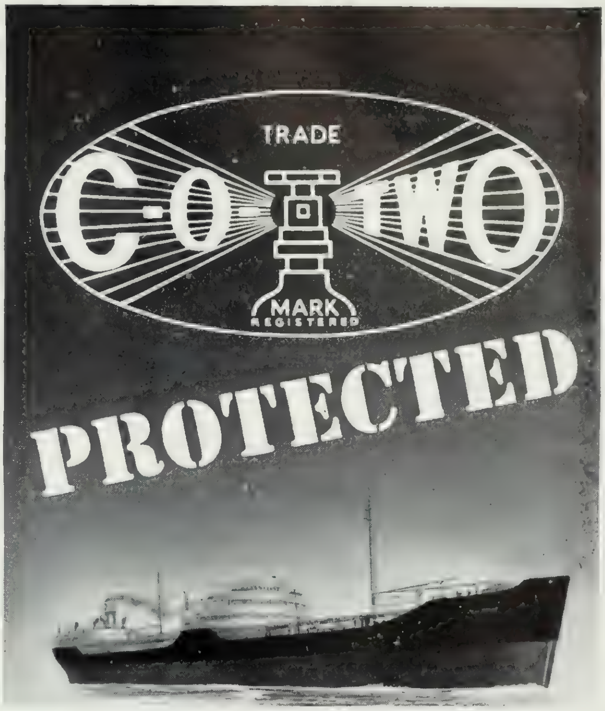

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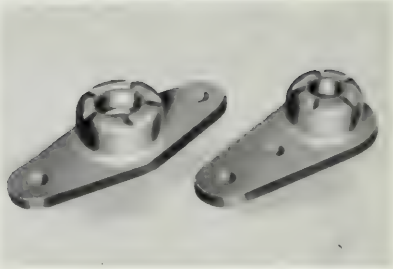


Simplified "Liberty Ship" Radio

A new type of commercial marine radio equipment of revolutionary design, which can be installed on board ship in one-fifth the time usually required, has been developed in connection with the emergency shipbuilding program. Among the vessels on which it is to be installed are the 312 "Liberty Ships" now being built by the Maritime Commission. The new unit combines in a single cabinet, radio equipment which ordinarily requires as many as twelve separate units and eliminates the intricate system of interconnecting wiring in the radio cabin. It includes all of the radio apparatus necessary for safety and communication purposes.

The new set was designed and is being manufactured by the Federal Telegraph unit of International Telephone & Radio Manufacturing Corporation. It will be made available to private shipping and shipbuilding companies through the Mackay Radio and Telegraph Company. Both companies are associated with the International Telephone and Telegraph Corporation.

The equipment was designed to meet the speed requirements of the emergency shipbuilding program in making it possible to do at the factory practically all wiring and other work usually done on the ships at the building yards. The new unit is practically ready to "plug in" at the power supply and radio antenna system when it arrives at the ship. This not only results in a great saving of time, but releases many hours of highly skilled labor for other national defense work since the installation job is comparatively simple.

The combining of all apparatus in a single cabinet also means an important saving in space on the ships.

The fact that all installations are standard is expected to speed considerably the training of new operators. Each switch and each button is in exactly the same place on every ship carrying the equipment.

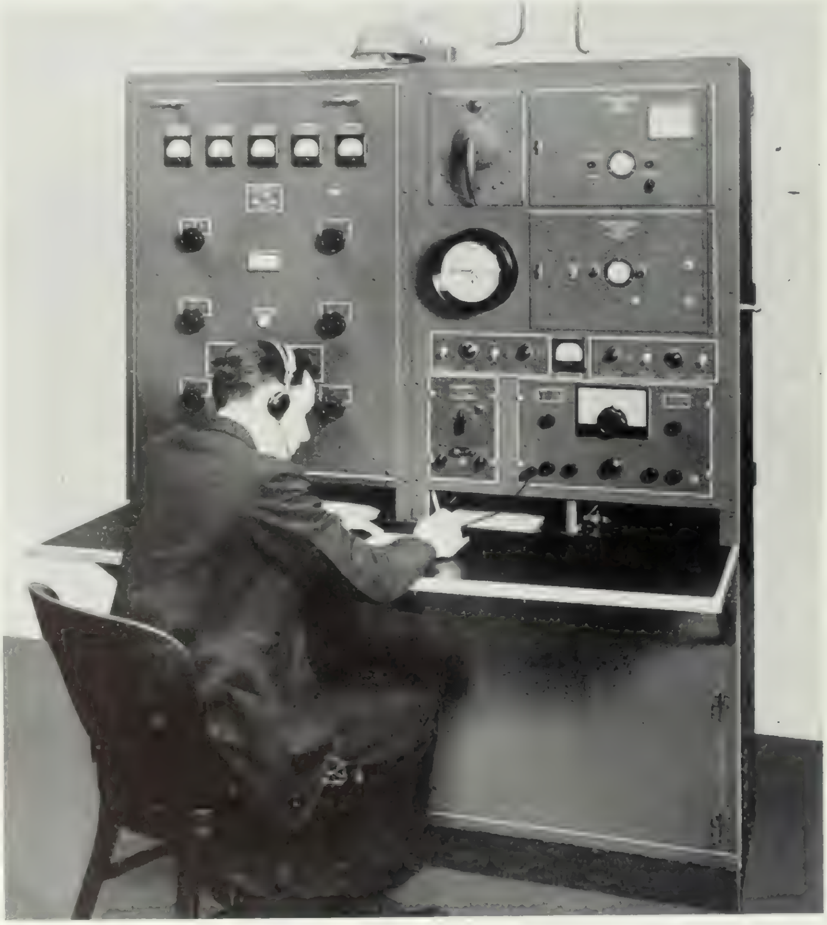
The time-saving advantages and the great simplicity of design and operation combined in this new type equipment are regarded by ship radio engineers as one more of the many permanent technical contributions made possible by the National Defense Program.

Anchor Type Elastic Stop Nuts

Following the successful use of their anchor type nuts in aircraft construction, Elastic Stop Nut Corporation now offers these nuts for blind-mounting applications on general industrial equipment.

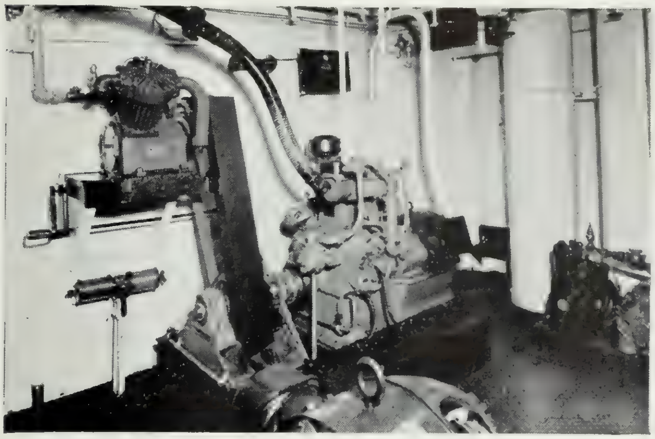
Designed to provide vibration-proof fastenings for removable plates used to cover hand holes, access and inspection openings; and for other blind mount attachments, anchor nuts are permanently riveted to the inside

(Page 98, please)



New simplified Mackay marine radio equipment for the "Liberty Ships"

Superior DIESEL POWER FOR TUG BOATS



Superior Diesel Auxiliary Engine in the new tug "Chipola" owned by the Coast Transportation Co. of New Orleans, La.

The selection and arrangement of Diesel Auxiliary units for tug boats is always an important part of the Naval Architect's job.

Generally, as in this case, one engine must do two or three jobs singly or together and the space limitations often present many knotty problems.

The simplicity and time-tested reliability of Superior Main and Auxiliary engines have made engine selection a simple matter for those who specialize in tow boat design.

Here is a sound reason why so many tugs and tow boats of all types are SUPERIOR POWERED throughout.

Chipola's main engine is a Superior 8-cylinder, 12½" x 15", 560 H. P. Diesel.

THE NATIONAL SUPPLY COMPANY

SUPERIOR ENGINE DIVISION

FACTORIES: Springfield, Ohio; Philadelphia, Pa.

SALES OFFICES: Springfield, Ohio; Philadelphia, Pa.; New York, N.Y.; Los Angeles, Calif.; Jacksonville, Fla.; Houston, Texas; St. Louis, Mo.; Fort Worth, Texas; Tulsa, Okla.; Boston, Mass.

Ship's galley of the S. S. Delbrasil is equipped with Emerson-Electric Fans

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EMERSON-ELECTRIC FANS...

They are protected against Salt Atmosphere Corrosion

Because they are engineered from base to guard for marine service, Emerson-Electric Marine Fans are found on passenger liners, freighters and pleasure craft. Wherever cooling breezes make for comfort or better working conditions, specify Emerson-Electric Fans, with the famous 5-Year Guarantee.

Send for Marine Fan Catalog No. 506

Emerson-Electric "Salt-water" Marine Fans are available in three sizes. Catalog No. 506 gives full details. For information on "Fresh-water" Marine Type Fans ask for Catalog 533.

EMERSON-ELECTRIC Fans are made in two lines, for "Salt-water" and "Fresh-water" service.

THE EMERSON ELECTRIC MANUFACTURING COMPANY
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EMERSON ELECTRIC
MOTORS — FANS — APPLIANCES
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LEADERS IN THE ELECTRICAL INDUSTRY SINCE 1890

PROGRESS IN *American Shipyards*

★ Asterisk indicates new listings.

Pacific Coast

ALBINA ENGINE & MACHINE WORKS, INC.
Portland, Oregon

New Construction:

Hulls Nos. 51-59, nine 165′ steel submarine chasers for U. S. Navy.

ANDERSON & CHRISTOFANI
San Francisco, Calif.

New Construction:

Six 97′ AMC coastal mine sweepers for U. S. Navy.

One 48′ yacht for Herman Hogrefe. **Completed.**

One 60′ purse seiner for S. Piazza.

ASSOCIATED SHIPBUILDERS
Seattle, Wash.

New Construction:

One insulated self-propelled lighter for delivery to U. S. Navy at Puget Sound Navy Yard.

Four small seaplane tenders for delivery to Puget Sound Navy Yard.

★ **Six wooden mine sweepers** for delivery to U. S. Navy at Puget Sound Navy Yard.

ASTORIA MARINE CONSTRUCTION CO.
Astoria, Ore.

New Construction:

Four 135′ wooden diesel-powered mine sweepers for U. S. Navy. Delivery in 14 months.

BASALT ROCK CO., INC.
Shipbuilding Yard—Napa, Calif.

New Construction:

Hulls Nos. 22-23, two 10,000-bbl. fuel oil tankers, for delivery to Mare Island Navy Yard. 235′ x 37′ x 19′3″; 1000-hp diesel electric; cost $1,800,000. Contract awarded by Navy Dept., Bureau of S. & A., Washington, D. C. Keel laying dates, No. 22, June 20, 1941; No. 23, August, 1941. **Launching dates, No. 22, October, 1941;** No. 23, December, 1941. Delivery dates, No. 22, January 30; No. 23, May 30, 1942.

Hull No. 28, self-propelled lighter for U. S. Navy. 132′6″ x 30′ x 12′4″; 300-hp diesel; 500 gross tons; cost $370,000. Delivery date, February 15, 1942.

Hulls Nos. 29 and 34, two open lighters for U. S. Navy. 110′ x 34′ x 11′8″; 500 gross tons; cost $216,000. **Delivery date, November 15, 1941.**

Hulls Nos. 37-38, two open lighters for Navy Contractors. 124′ x 36′ x 10′; 450 gross tons; cost $102,000. **Delivery date, October 1, 1941.**

BERKELEY STEEL CONSTRUCTION CO.
Berkeley, California

New Construction:

One all-welded utility diesel-electric stern wheeler for U. S. Engineers. 102′ x 26′ x 5′. Cost $114,800.

BELLINGHAM MARINE RAILWAY & BOATBUILDING COMPANY
Bellingham, Wash.

New Construction:

Hulls Nos. 17-20, four mine sweepers for the U. S. Navy. Keel laying dates, No. 71, July 16; No. 18, July 22; No. 19, July 26; No. 29, July 31, 1941.

BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Division—San Francisco Yard
San Francisco, Calif.

New Construction:

Hulls Nos. 5368-5383, sixteen 2100-ton destroyers, DD526-DD541.

Hulls Nos. 5366-5367, two 1650-ton destroyers, DD459-DD460, for U. S. Navy. Keels laid January 13, 1941.

Hulls Nos. 5390-5396, seven 1620-ton destroyers, DD605 - DD611. Keel laying dates, Nos. 5390, 5391, March 25 and 28, 1941.

Hulls Nos. 5386-5389, four 6000-ton cruisers, CL95-CL98. Keel laying dates, No. 5386, July 13; No. 5387, August 1, 1941.

BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Division—San Pedro, Calif.

New Construction:

Hulls Nos. 9001-9004, four 2100-ton destroyers, DD544-DD547.

Hulls Nos. 9007-9012, six 1620-ton destroyers, DD612-DD617. Keel laying dates, Nos. 9007, 9008, May 1, 1941; Nos. 9009, 9010, May 29, 1941.

BIRCHFIELD BOILER CO., INC.
Tacoma, Washington

New Construction:

One U. S. Coast Guard Cutter for Columbia River and Snake River.

N. J. BLANCHARD BOAT CO.
Seattle, Washington

New Construction:

One sloop, 52′ x 11½′, 50-hp gas engine.

Three 45′ aircraft tenders or rescue boats for the U. S. Navy.

CALIFORNIA SHIPBUILDING CORP.
Wilmington, California

New Construction:

Hulls Nos. 1-55, fifty-five EC-2 type cargo vessels for U. S. Maritime Commission. **Fourteen keels laid up to October 14, 1941. Launching date, No. 1, September 27.**

CAMPBELL MACHINE CO.
San Diego, Calif.

New Construction:

Hull No. 69, 450-ton fishing boat for A. Tavaras & Co., 110′x26′x12′; 350-hp Union diesel. Cost $170,000. Keel laid June 1, 1941. **Launching date, October 25, 1941.**

Hull No. 70, 550-ton fishing boat for G. Vattuone & Co. 128′x12′ 6″; 500-hp Union diesel. Cost $210,000. Keel laid June 15, 1941. Launching date, December 15, 1941.

COLBERG BOAT WORKS
Stockton, Calif.

New Construction:

Three large wooden mine sweepers for U. S. Navy.

COMMERCIAL IRON WORKS
Portland, Ore.

New Construction:

Four anti-submarine net tenders. Completed September, 1941.

Seven steel mine sweepers for U. S. Navy.

★ **Four fleet tugs** for U. S. Navy.

★ **Four steel submarine chasers** for U. S. Navy.

CONSOLIDATED STEEL CORP., LTD.
Los Angeles, Calif.

New Construction:

Hulls Nos. 157, Aguiprince; 158, Alcoa Pennant; 159, Alcoa Polaris; 222-251, 33 C-1-BT, full scantling, turbine propulsion cargo vessels for U. S. Maritime Commission. **Keel laying dates,** No. 159, April 7; **No. 222, November 20; No. 223, November 25;** No. 224, December 20; No. 225, December 29, 1941. Launching dates, No. 157, March 27; No. 158, June 26; No. 159, September 27, 1941; No. 222, March 30; No. 223, April 17; No. 224, May 4; No. 225, May 22, 1942. **Delivery dates, No. 157, November 10;** No. 158, December 8, 1941; No. 159, January 15, 1942.

Hulls Nos. 206, U. S. S. Doyen; 207, U. S. S. Feland; two design P1-S2-L2 twin-screw turbine propulsion transports for the U. S. Maritime Commission. **Keel laying dates,** No. 206, September 18; **No. 207, November 10, 1941.** Launching dates, No. 206, February 18; No. 207, June 17, 1942. Delivery dates, No. 206, June 29; No. 207, October 26, 1942.

William Le Roy Emmet

William Le Roy Emmet, consulting engineer of the General Electric Company—known for his contributions in the fields of power generation and ship propulsion—died September 26 at Erie, Pa., at the home of his nephew, H. L. R. Emmet, manager of G-E's Works there. Mr. Emmet had been ailing from a heart condition. He was 82.

As early as 1909, Mr. Emmet had pointed out that electric ship propulsion was feasible, economical, and practical. He did significant work in developing the steam turbine from the embryonic to the practical stage, and worked out the Emmet mercury vapor process of power generation. A total of 122 patents were issued in his name.

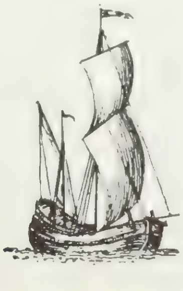
Born at Pelham, N. Y., July 10, 1859, Mr. Emmet was educated at schools in Canada, New York, and subsequently entered the United States Naval Academy, where he was graduated in 1881.

Mr. Emmet first became associated with electrical work in 1887 when he entered the employ of the Sprague Electric Railway and Motor Co. He later went with the Buffalo Railway Co. as electrical engineer, and soon afterward accepted a position with the Edison General Electric Company, in the Chicago district. He came to Schenectady in 1892 when the Thomson-Houston Company joined with the Edison General Electric Company to form the General Electric Company.

Mr. Emmet's initiative, ideas, and experimentation played a great part in the adoption of the steam turbine for central station power generation. Also, largely through his efforts, the Navy Department in 1913 was induced to allow an installation of turbine-electric drive in the Collier Jupiter. The success of this installation led to the adoption of electric drive for a number of subsequent large U. S. Navy warships, first of which was the New Mexico.

Mr. Emmet was a member of the American Philosophical Society, A. I. E. E., A. S. M. E., Society of Naval Architects and Marine Engineers, and of the War Time Consulting Board of the United States. He was also a member of the University and Engineers' Clubs of New York, The Mohawk Club, Tobique Salmon, Mohawk, Edison, and Schenectady Boat Clubs.

He received the honorary degree of D.Sc. from Union College in 1910, and later the same degree was conferred upon him by Trinity College. He was awarded the Gold Medal at the St. Louis Exposition for his work in developing the vertical shaft turbine, the Gold Medal for electric ship propulsion at the San Francisco Exposition, and the Elliott Cresson Medal in 1920.



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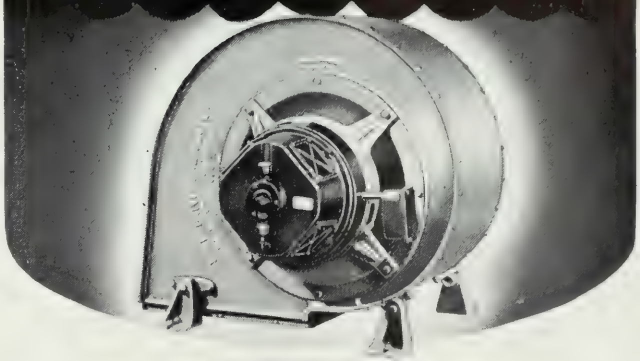
ILG MARINE BLOWERS
...popular because they give *more* ventilation per inch of space, per lb. of weight, per dollar of cost.



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- ★ Hulls 223-232 C-I-A Cargo Boats. Pennsylvania Shipyards, Inc.....Beaumont, Texas
- ★ U. S. S. Crescent City conversion. Alabama Drydock & Shipbuilding Co.....Mobile, Ala.
- ★ Hulls 223-225 Tankers for Texas Co. Sun Shipbuilding & Drydock Co.....Chester, Pa.

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Offices in 43 Principal Cities

ILG *Vitalized**
VENTILATION
AND AIR CONDITIONING
*AIR CHANGE...NOT JUST AIR MOVEMENT!

FELLOWS & STEWART, INC.

Wilmington, California

New Construction:

One 100′ V-bottomed kelp harvester.

Two 45′ taxi boats.

Six landing floats for California Shipbuilding Co., Terminal Island. Two, 25′x65′; one 25′x60′; three 12′x60′.

F. L. FULTON

Antioch, Calif.

New Construction:

Six 97′ wooden mine sweepers for U. S. Navy.

GEN. ENGINEERING & DRY DOCK CO.

Alameda, Calif.

New Construction:

Three anti-submarine net tenders for U.S. Navy. **Delivery dates, Ebony, September 16; Eucalyptus, October 9, 1941.**

Eight mine sweepers for U. S. Navy.

HARBOR BOAT BUILDING CO.

Terminal Island, Calif.

New Construction:

Four 60-foot U. S. Navy target boats. Delivery dates, two, October 11; two, October 25, 1941.

Hulls Nos. 117-120, four 136′ motor mine sweepers for U. S. Navy. Keels laid, No. 117, May 8, 1941; No. 118, May 12, 1941; No. 119, July 15, 1941; No. 120, August 23, 1941. Launched No. 117, August 23, 1941.

HUBBARD'S SOUTH COAST COMPANY

Newport Beach, California

New Construction:

Four 45′ twin-screw aircraft tenders for U. S. Navy.

Six 135′ mine sweepers for U. S. Navy.

KRUSE & BANKS SHIPBUILDING CO., INC.

North Bend, Oregon

New Construction:

Hulls Nos. 121-124, four 135′ wooden mine sweepers, YMS type, for U. S. Navy. Cost $1,800,000.

LAKE WASHINGTON SHIPYARDS

Houghton, Wash.

New Construction:

Four anti-submarine net tenders.

Four thousand A. S. N. T. floats.

Coast and Geodetic Survey ship.

Six seaplane tenders for U. S. Navy.

AL LARSON BOAT SHOP, INC.

Terminal Island, Calif.

New Construction:

Hulls Nos. 112-113, two mine sweepers, YMS 86 and YMS 87, for U. S. Navy. Keels laid, No. 112, June 20; No. 113, July 18, 1941. **Delivery dates, No. 112, November 27, 1941;** No. 113, March 27, 1942.

LOS ANGELES SHIPBUILDING & DRY DOCK CORP.

San Pedro, Calif.

New Construction:

Hulls Nos. AR6-AR8, three repair vessels for U. S. Navy.

Hulls Nos. AV 11-AV 13, three seaplane tenders for U. S. Navy.

MOORE DRY DOCK CO.

Oakland, Calif.

New Construction:

Hulls Nos. 201-203, three cargo and passenger vessels for U. S. Maritime Commission and Alcoa Steamship Co. 442′x62′x25′; depth molded to bridge deck 41′6″; 8500 hp; 17 knots speed; passenger carrying capacity 38. Keel laying dates, March 26, June 3 and August 6, 1941. **Launching date, No. 201, October 21, 1941.** Estimated delivery dates, January 1, March 15 and June 1, 1942.

Hulls Nos. 212-213, two submarine tenders, for U. S. Navy. Keels laid, No. 212, July 31; No. 213, September 15, 1941.

Five submarine rescue vessels for U. S. Navy. Hull laid for one, September 15, 1941.

Six C-2 cargo vessels.

Twelve C-2 cargo vessels.

OLSON & WINGE MARINE WORKS

Seattle, Wash.

New Construction:

Hulls Nos. 40-45, six 40′ motor sailers for U. S. Army. Keels laid, three, September 15, 1941.

Conversions:

Five for the U. S. Army. Total cost, $50,000.

OREGON SHIPBUILDING CORP.

Portland, Oregon

New Construction:

Hulls Nos. 170-200 and 229-240, forty-three EC-2 type cargo vessels for U. S. Maritime Commission. Keel laying dates, No. 170 and No. 171, May 19; No. 172 and No. 173, May 31; No. 174, July 11; No. 175, No. 176 and No. 177, July 18; No. 178, September 18; No. 179 and No. 180, September 20; No. 181, September 30, 1941. Launching date, No. 171, September 27, 1941.

PACIFIC BRIDGE CO.

San Francisco, Calif.

New Construction:

One seagoing drydock for U. S. Navy. Cost $1,649,000.

PACIFIC DRY DOCK & REPAIR CO.

Oakland, Calif.

New Construction:

One all-welded steel oil barge. 148′ x 38′ x 9′; 300,000 gal. capacity.

Lighters. Cost $284,572.

RICHMOND SHIPBUILDING CORP.

Richmond, Calif.

New Construction:

Hulls Nos. 41-64, twenty-four EC-2 type cargo vessels for U. S. Maritime Commission **Keel laying dates,** No. 41, No. 42 and No. 43, September 17; No. 44, September 20; No. 45, September 25; No. 46, September 30; **No. 47, October 31, 1941.**

SAN DIEGO MARINE CONST. CO.

San Diego, Calif.

New Construction:

Four large wooden mine sweepers for U. S. Navy.

SEATTLE SHIPBUILDING AND DRY DOCK CO.

Seattle, Wash.

New Construction:

Four 136′ mine sweepers for U. S. Navy.

SEATTLE-TACOMA SHIPBUILDING CORP.

Tacoma, Wash.

PLANT No. 1

New Construction:

Hulls No. 6, Frederick Funston; No. 7, James O'Hara, two C-3 shelter deck type cargo steamers for U. S. Maritime Commission. To be converted on completion to U. S. Army troopships. Keel laying dates, April 21 and June 16, 1941. Launching dates, September 27, 1941, and January 12, 1942.

Hulls Nos. 8-11, four C-3 cargo ships for U. S. Maritime Commission. 492′ x 69′6″ x 42′6″ (molded); 8900 tons; 8500-hp steam turbine propulsion; cost $2,990,000. **Keel laying dates,** June 18, September 29, **October 24 and November 5, 1941. Launching dates, October 22, 1941;** February 12 and 28, and March 1, 1942. Delivery dates, No. 8, February; No. 9, May; No. 10, June; No. 11, June, 1942.

Hulls Nos. 12, Patapsco; 13, Rappahannock; 14, Rio Grande; 15, Wabash; 16, Susquehanna; five TI-MT-MI tankers for U. S. Navy. 310′9″ x 48′6″ x 19′9′. Keel laying dates, No. 12, February 15; No. 13, March 1; No. 14, May 15; No. 15, June 1; No. 16, June 2, 1942. Launching dates, No. 12, May 27; No. 13, May 28; No. 14, August 12; No. 15, August 27; No. 16, August 28, 1942. Delivery dates, No. 12, August 30; No. 13, September 1; No. 14, November 30; No. 15, November 30; No. 16, December 1, 1942.

Hulls Nos. 17-46, thirty C-3 cargo vessels for U. S. Maritime Commission. 492′ x 69′6″ x 42′6″; 8900 tons; 8500-hp steam turbine propulsion. Delivery dates, first, June, 1942; last, October, 1943.

SEATTLE PLANT

New Construction:

Twenty-five destroyers for U. S. Navy.

THE SHAIN MANUFACTURING CO.

Seattle, Washington

New Construction:

One 65′ ferryboat for U. S. Navy.

One model 30 trimmer ship Air Flo sedan for Chas. Cole, Seattle; Chrysler Crown.

One model 36 trimmer ship Air Flo sedan for Paul Isaacson, Seattle; Chrysler Crown.

One model 50 trimmer ship ferry for Horluck Trans. Co., 110-hp Buda diesel.

One model 49 trimmer ship, express cruiser. for stock.

One 50′ commodore model trimmer ship for E. Ramey.

One 38′ sedan trimmer ship for U. S. Customs.

STEPHENS BROS.

Stockton, Calif.

New Construction:

Three large wooden mine sweepers for U. S. Navy.

TODD-CALIFORNIA SHIPBUILDING CORP.

Richmond, Calif.

New Construction:

Thirty cargo vessels for British Purchasing Commission. 10,000 dwt; 416′ long, 57′ beam. Cost $50,000,000. First vessel, Ocean Vanguard, launched August 16, 1941.

TODD-SEATTLE DRY DOCKS

Seattle, Wash.

Conversion work.

UNITED ENGINEERING CO., LTD.

San Francisco, Calif.

New Construction:

Hulls Nos. 17-20, four 205′ Navy fleet tugboats, for U. S. Navy.

Hulls Nos. 21-24, four 205′ Navy fleet tugboats, for U. S. Navy.

WESTERN BOAT BUILDING CO., INC.

Tacoma, Wash.

New Construction:

Hull No. 146, M. V. Colonel Leon M. Logan, for U. S. Army. 400-hp Atlas diesel. **Delivery date, November 1, 1941.**

COEN

MULTIFILM OIL HEATERS

Are of all steel construction, light weight, small in size, cleanable and many installations have proved them to be most satisfactory. They are approved for marine service and at the present time early shipments can be made.

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Combustion Engineers

SAN FRANCISCO **NEW YORK**

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● Designed and built for years of marine fire protection, this *approved* Buffalo Extinguisher gives fast, smothering action on all kinds of blazes. Easy to operate. Sturdily built, 2½ gallon capacity. Complies with regulations of U. S. Steamboat Inspection Service.

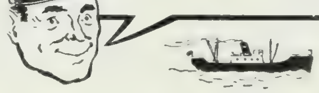
OREGON MARINE SUPPLY CO.
Portland and Astoria, Ore.
PACIFIC MARINE SUPPLY CO.
Seattle, Wash.
WESTERN FIRE EQUIPMENT CO.
San Francisco, Calif.

Buffalo Fire Appliance Corp.
44 Central Avenue Buffalo, N. Y.

BUFFALO *Better Built* **FIRE EXTINGUISHERS**

NOW WE SELDOM PULL HER TAIL SHAFT

—AND WE USED TO DO IT OFTEN!

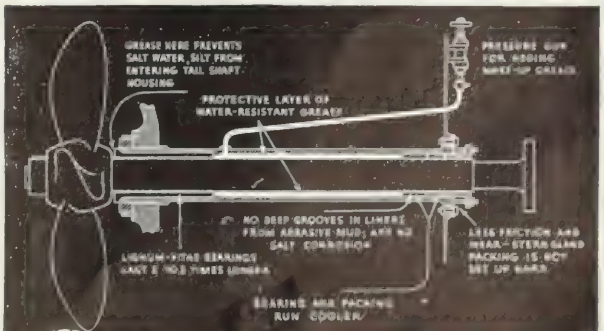


Lignum vitae bushings become *twice as efficient* when they're lubricated with grease.

There's no corrosion in the shaft alley well. Bearings run cooler, wear less . . . actually last 2 to 3 times as long.

In reduced laid-up time and lower dry-dock bills, Shell Stern Tube Lubrication has already saved thousands of dollars for the owners of more than 700 ships and boats on this coast.

Investigate this new method. Phone nearest Shell office or write to Industrial Lubricants Division, Shell Building, San Francisco, California.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PROTECTIVE LAYER OF WATER-RESISTANT GREASE
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NO DEEP GROOVES IN LINERS FROM ABRASIVE MUD; AND NO SALT CORROSION
LIGNUM-VITAE BEARINGS LAST 2 TO 3 TIMES LONGER
LESS FRICTION AND WEAR—STERN GLAND PACKING IS NOT SET UP HARD
BEARING AND PACKING RUN COOLER

SHELL STERN TUBE LUBRICATION

Hulls Nos. 147-148, two U. S. Minesweepers, Y.M.S. 133-Y.M.S. 134. Keel laying dates, No. 147, June 28, 1941; No. 148, August 12, 1941. Launching date, No. 147, **November 15, 1941.**

Hull No. 146, boat, purchased by Army Quartermaster General. 95' x 24' x 11'. **Delivery date, November 1, 1941.**

WESTERN PIPE AND STEEL CO.
South San Francisco, Calif.

New Construction:

Hulls Nos. 62-65, 77-95, twenty-three C-3 cargo ships for U. S. Maritime Commission. 492' x 69' x 42'6"; 8900 tons; 8500-hp; steam propulsion; $2,990,000 each. Keel laying dates, No. 62, April 17; No. 63, May 29; No. 64, July 17; No. 65, September 30, 1941. Launching dates, No. 62, September 27, 1941.

WILLAMETTE IRON & STEEL CORP.
Portland, Ore.

New Construction:

Two minelayers, CM6, U. S. S. Catskill, and CM7, U. S. S. Ozark, for U. S. Navy.

Atlantic, Lakes, Rivers

ALABAMA DRY DOCK & SHIPBUILDING CO.
Mobile, Ala.

New Construction:

Hulls Nos. 228-229, two tugs for Mobile Towing & Wrecking Co.

Hull No. 230, tug, for stock.

Hulls Nos. 231-243, thirteen all-welded Emergency cargo vessels for U. S. Maritime Commission. Cost $19,500,000.

Hull No. 244, 18,000-ton floating dock, for Todd Shipyards Corp., Galveston.

LESTER F. ALEXANDER CO.
New Orleans, La.

New Construction:

Two tugs, Trade Wind and Fair Wind. 68' x 17', 220-hp Atlas engines.

Six barges for U. S. Engineers, Philadelphia, Pa. Four, 50'x20'x5'; two, 92'x26'x6'.

★ **Two tugs, Samba and Galeta,** for U. S. Engineers, Philadelphia, Pa., for use at Panama Canal. 220-hp Atlas Imperial engine.

★ **One barge** for Southern Tug and Barge Co. 54' x 150' x 8'6".

AMERICAN BRIDGE COMPANY
Pittsburgh, Pa.

New Construction:

Eight dump scows. 160' x 50'6" x 13'6"; for Panama Canal.

Ten coal barges for stock. 175' x 26' x 11'.

Sixteen sand barges for the Panama Canal. 160' x 50'6" x 13'6".

Sixty coal barges for Carnegie-Illinois Steel Corp. 175'x26'x11'.

Five barges for U. S. Engineers Office, Panama Canal District. 126'x26'x11'.

AMERICAN CAR & FOUNDRY CO.
Wilmington, Delaware

New Construction:

Thirty-eight 45' lighters, equipped with tanks for carrying liquids, for U. S. Navy Total cost $1,020,262.

Four 135' mine sweepers for Navy Dept., Bureau of Supplies and Accounts. Total cost $1,340,000.

THE AMERICAN SHIP BUILDING CO.
Cleveland, Ohio

New Construction:

Twelve net tenders for U. S. Navy; (6 at Lorain, Ohio; 6 at Cleveland, Ohio). 151'8" x 30'6" x 16'6"; diesel-electric propulsion; contract price $6,357,000. **Six delivered as of October 11, 1941.**

Four diesel trawlers for General Seafoods Corp. 146'8" L. O. A. x 26'0" x 14'4". (2 at Lorain, Ohio; 2 at Cleveland, Ohio.) **Delivery date, November 15, 1941.**

Eight mine sweepers (4 at Lorain, Ohio; 4 at Cleveland, Ohio) for U. S. Navy; 220' O.A. x 32' x 17'; diesel-electric propulsion; contract price, $13,736,000.

Two bulk freighters (at Lorain, Ohio) for Pittsburgh Steamship Company; 640' O.A. x 67' x 35'; geared-turbine propulsion. **Delivery date, October 1, 1942.**

Fifteen 2500-ihp, three cylinder triple expansion engines for Maritime Commission design EC2-S-C1 cargo vessels.

BATH IRON WORKS
Bath, Maine

New Construction:

Hulls Nos. 185-187, three cargo ships for American Export Lines. 400' x 60' x 39'. **Delivery dates, No. 185, October, 1941;** No. 186, April; No. 187, June, 1942.

Hulls Nos. 188-189, DD457 and DD458, two destroyers for U. S. Navy. Delivery dates December, 1941, and February, 1942.

Hulls Nos. 190-195, DD449-451, 467-469, six destroyers for U. S. Navy.

Hulls Nos. 196-206, DD507-DD517, eleven destroyers for U. S. Navy.

Hulls Nos. 208-213; DD629-DD631; DD 642-DD644; six destroyers for U. S. Navy.

BETHLEHEM STEEL COMPANY
Shipbuilding Division—Fairfield Yard
Baltimore, Md.

New Construction:

Hulls Nos. 2001-2062, sixty-two EC-2 type cargo vessels, for U. S. Maritime Commission. **Keel laying dates,** No. 2001, March 30; No. 2002, May 15; No. 2003, June 21; No. 2004, June 21; No. 2005, July 15; No. 2006, July 15; No. 2007, August 15; No. 2008, August 25; No. 2009, September 3; No. 2010, September 12; No. 2011, September 22; No. 2012, September 27; **No. 2013, October 13, 1941.** Launching date, No. 2001, September 27, 1941.

BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Division—Fore River Yard
Quincy, Mass.

New Construction:

Hull No. 1478, Massachusetts, 35,000-ton battleship for U. S. Navy. Keel laid July 20, 1939. Launched September 25, 1941.

Hulls Nos. 1479, San Diego; and 1480, San Juan; two 6000-ton cruisers for U. S. Navy. Keels laid March 27 and May 15, 1940. Launching date, No. 1479, July 26; No. 1480, September 6, 1941.

Hull No. 1484, cargo vessel for U. S. Maritime Commission. 450' x 66' x 42'3"; 16½ knots; geared turbines and water tube boilers; 14,500 tons. Launching date November 16, 1940.

Hulls Nos. 1489-1491, three tankers for Sinclair Refining Co., 10,700 tons dwt. Keels laid, No. 1489, March 18, 1941; No. 1490, May 31, 1941. Launching date, No. 1489, August 7; No. 1490, September 27, 1941. **Delivery date, September 20, 1941.**

Hulls Nos. 1492-1493, two tankers for Sinclair Refining Co. 15,450 tons dwt. Keel laying date, No. 1492, August 9, 1941.

Hulls Nos. 1494-1497, four heavy cruisers for U. S. Navy. **Keel laying dates,** No. 1494, May 26; No. 1495, June 30; No. 1496, September 3; **No. 1497, October 9, 1941.**

Hulls Nos. 1498-1501, four light cruisers for U. S. Navy. Keel laid, No. 1498, September 23, 1941.

Hulls Nos. 1502-1503, two light cruisers for U. S. Navy.

Hulls Nos. 1504-1507, four heavy cruisers for U. S. Navy.

Hulls Nos. 1508-1511, four aircraft carriers for U. S. Navy. Keel laying date, No. 1508, July 15; No. 1509, September 15, 1941.

Hulls Nos. 1513-1515, three trawlers. Keels laid, No. 1513, March 26; No. 1514, June 14; No. 1515, July 12, 1941. Launching dates, No. 1513, July 10, 1941.

Hulls Nos. 1516-1519, four 1650-ton destroyers for U. S. Navy. Keel laying date, No. 1516, May 1; No. 1517, May 20, 1941.

BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Div.—Sparrows Point Yard
Sparrows Point, Md.

New Construction:

Hull No. 4348, C-1 cargo vessel. LOA 416', LBP 395', beam 60', depth 37'6". Keel laid March 13, 1941.

Hulls Nos. 4351-4352, two cargo vessels for Seas Shipping Co. 450' x 66' x 34'; 6300 hp; 8500 gross tons. Keel laying dates, No. 4351, December 12, 1940; No. 4352, January 22, 1941. Launching date, No. 4351, July 26, No. 4352, August 29, 1941.

Hulls Nos. 4354-4356, three oil tankers for Socony Vacuum Oil Co. 487'6" x 68' x 37'; 12,000 hp, 9800 gross tons. Keel laying dates, No. 4354, September 16, 1940; No. 4355, April 23; No. 4356, July 8, 1941. Launching date, No. 4354, July 1, 1941.

Hulls Nos. 4358-4359, two oil tankers for Socony Vacuum Oil Co. 487'6" x 68' x 37'; 12,000 hp; 9800 gross tons. Keel laid, No. 4358, August 1, 1941.

Hulls Nos. 4360-4361, two oil tankers for Union Oil Co. 442' x 64' x 34'10"; 3500 hp; 8000 gross tons. Keel laying date, No. 4360, June 18, 1941.

Hulls Nos. 4362-4364, three cargo and passenger vessels for Mississippi Shipping Co. 465' x 65'6" x 39'9"; 7800 hp; 8300 gross tons. Keel laid, No. 4362, September 4, 1941.

Hull No. 4365, oil tanker for Richfield Oil Co. 442' x 64' x 34'10"; 3500 hp; 8000 gross tons. Keel laid May 21, 1941.

Hulls Nos. 4367-4368, two oil tankers for Panama Transport Co. 487'6" x 68' x 37'; 7000 hp; 9800 gross tons.

Hull No. 4369, oil tanker for Continental Oil Co. 442' x 64' x 34'10"; 3500 hp; 8000 gross tons.

Hulls Nos. 4371-4372, two oil tankers for Gulf Oil Co. 442' x 64' x 34'10".

Hull No. 4373, tanker for Panama Transport Co. 487'6" x 68' x 37'; 7000 hp; 9800 gross tons.

Hulls Nos. 4374-4375, two tankers for Union Oil Co. of Calif. 487'6" x 68' x 37'; 7000 hp; 9800 gross tons.

Hulls Nos. 4376-4377, two tankers for Socony Vacuum Oil Co. 487'6" x 68' x 37'; 4800 hp; 9800 gross tons.

BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Div.—Staten Island Yard
Staten Island, N. Y.

New Construction:

Hulls Nos. 8021-8022, two destroyers for U. S. Navy.

Hulls Nos. 8023-8029; 8033-8035; ten destroyers for U. S. Navy.

BURGER BOAT CO.
Manitowoc, Wisconsin

New Construction:

One yacht, 65'x16'x8', Buda diesel engine.

One ferryboat, 110' x 32' x 8', 330-hp Gray diesel engine.

Six 135' wooden motor mine sweepers for U. S. Navy.

IRA S. BUSHEY & SONS, INC.
Brooklyn, N. Y.

New Construction:

Hull No. 497, tug. 90'; 805-hp F-M diesel. **Delivery date, November, 1941.**

Hull No. 498, 156-foot oil tanker. Delivery date, February, 1942.

Hull No. 499, 156-foot oil tanker. Delivery date, March, 1942.

Hull No. 500, wooden drydock section for Bethlehem Steel Co. Delivery date, October, 1942.

Hulls Nos. 503-504, two 100' steel tugs, for U. S. Maritime Commission. 805-hp.

Hulls Nos. 505-506, two drydocks, for U. S. Navy.

Hulls Nos. 507-509, three 100' steel tugs, for U. S. Navy. 805 hp.

★ **Hull No. 510, deck scow** for A. J. Harper, Baltimore, Md. 117' x 36' x 10'.

★ **Hulls Nos. 511-513, three 100' steel tugs,** for Maritime Commission. 805-hp.

CALUMET SHIPYARD & DRY DOCK CO.
Chicago, Illinois

New Construction:

Four all-welded distribution box boats for Quartermaster Corps., U. S. Army, 65' x 18', diesel propelled. Total cost $212,000.

Hull No. 126, all-welded steel towboat for Ashland Oil Refining Co., 145' x 32' x 9', 1600-hp diesel.

Hulls Nos. 131-132, two oil barges, standard river type, for Ashland Oil & Refining Co. 195' x 35' x 10'.

Hulls Nos. 133-135, 142-143, two three-barge units for Ashland Oil & Refining Co. Each unit, 195' x 35' x 10'; center section square on both ends; both end sections square on one end, raked on opposite end.

Hull No. 136, one river towboat for Ashland Oil & Refining Co. 245' x 32' x 90'. 1600-hp diesel.

★ **Hulls Nos. 137-141, five tugs** for U. S. Maritime Commission. 1050-hp.

CHARLESTON SHIPBUILDING & DRYDOCK COMPANY
Charleston, South Carolina

New Construction:

Eight 205' mine sweeping fleet tugs. Delivery for all by September, 1943.

CONSOLIDATED SHIPBUILDING CORP.
Morris Heights, N. Y.

New Construction:

Seven 165' steel submarine chasers for U. S. Navy.

CONSOLIDATED STEEL CORP. OF TEXAS
Orange, Texas

New Construction:

Two oil barges for C. F. Pillot, 165' x 36' x 10'3".

Two all-welded steel oil barges for Inland Waterways Corp., 196' x 35' x 10'6".

One drilling barge for Shell Oil Co., Inc., 118' x 44' x 10'.

One boiler barge for Shell Oil Co., Inc., 90' x 30' x 10'.

One transportation barge for Shell Oil Co., Inc. 80' x 24' x 5'.

Three transportation barges for Shell Oil Co., Inc. 40' x 16' x4'6".

CRAMP SHIPBUILDING COMPANY
Philadelphia, Pa.

New Construction:

Six cruisers, Cleveland class, for U. S. Navy.

★ **Four floating workshops** for U. S. Navy; two being completed in wet dock; two on the ways.

DEFOE BOAT & MOTOR WORKS
Bay City, Mich.

New Construction:

Hulls Nos. 171-174, four mine sweepers for U. S. Navy, 220' long.

Hulls Nos. 175-186, twelve 174' escort vessels for U. S. Navy.

Hulls Nos. 187-194, eight 174' sub-chasers for U. S. Navy.

Hulls Nos. 195-198, four 145' tugs for U. S. Navy.

★ **Hulls Nos. 199-204, five subchasers** for U. S. Navy.

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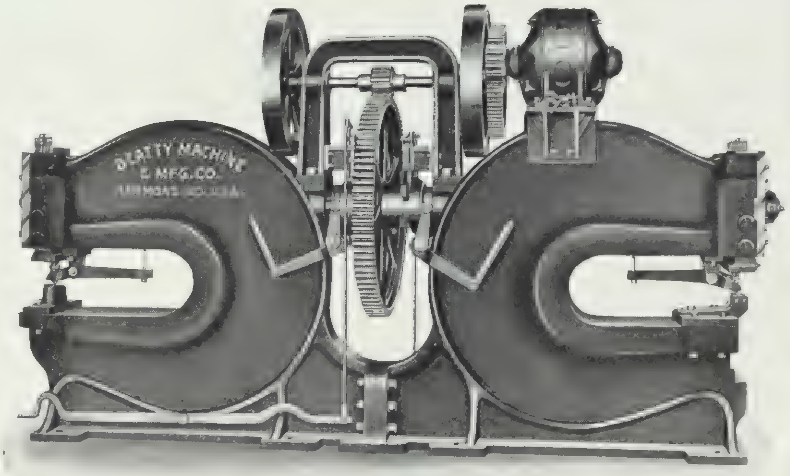
POWER PUNCHES and SHEARS



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BEATTY MACHINE & MFG. CO. HAMMOND, INDIANA

DELTA SHIPBUILDING CORP.

New Orleans, Louisiana

New Construction:

Twenty-five EC-2 Emergency type vessels for U. S. Maritime Commission. 416' x 56'10¾" x 37'4". 2500 hp triple expansion engine.

THE DRAVO CORPORATION

Engineering Works Division

Pittsburgh, Pa., and Wilmington, Del.

New Construction:

Hulls Nos. 1835-1840, six 165' type PC submarine chasers for U. S. Navy, Washington, D. C. 2010 gross tons.

Hull No. 1861, sand and gravel barge, for Keystone Sand Division. 135' x 27' x 8'; 255 gross tons.

Hulls Nos. 1868-1869, two 25-ton floating cranes, one each to Phil. and Norfolk U. S. Navy Yards, for U. S. Navy Dept., Washington, D. C.; 670 gross tons.

Hulls Nos. 1876-1877, two floating caisson gates for U. S. Navy, Philadelphia Navy Yard; 2330 gross tons.

Hull No. 1903, floating caisson gate for U. S. Navy, Norfolk Navy Yard; 1330 gross tons.

Hulls Nos. 1907-1911, five 165' type AM mine sweepers for Bureau Supplies & Accounts, U. S. Navy Dept., Washington, D. C.; 1675 gross tons.

Hulls Nos. 1912-1916, five 165' type PC submarine chasers for Bureau of Supplies & Accounts, U. S. Navy Dept., Washington, D. C.; 1675 gross tons.

Hull No. 1927, fabricated steel hull for oil barge. 165' x 35' x 10'; 502 gross tons.

Hulls Nos. 1928-1933, six welded steel deck barges for Delaware, Lackawanna & Western R. R., New York City. 100' x 30' x 9'6"; 1392 gross tons.

Hulls Nos. 1936-1945, ten welded steel oil barges, for stock. 195' x 35' x 9'9"; 5980 gross tons.

Hulls Nos. 1946-1955, ten W-7 welded steel coal barges for stock; 175' x 26' x 11'; 4720 gross tons.

Hull No. 1956, 25-ton floating crane for Charleston, S. C. Navy Dept., Washington, D. C.; 335 gross tons.

Hulls Nos. 1957-1966, ten type W-7 welded bulk cargo barges for stock. 175' x 26' x 11'; 4720 gross tons.

Hulls Nos. 1967-1972, six welded oil barges for stock. 195' x 35' x 9'9"; 3588 gross tons.

Hulls Nos. 1973-1976, four welded sand and gravel barges for Keystone Sand Div. 135' x 27' x 8'; 1020 gross tons.

Hulls Nos. 1977-1986, ten type W-7 welded bulk cargo barges for stock. 175' x 26' x 11'; 4720 gross tons.

Hulls Nos. 1987-1992, six welded oil barges for stock. 195' x 35' x 9'9"; 3588 gross tons.

Hulls Nos. 1993-2009, seventeen covered lighters for Bureau of Supplies and Accounts, Navy Dept. 8840 gross tons.

Hulls Nos. 2010-2011, two welded side-dump scows for Bureau S. & A., Navy Dept., Washington, D. C. 115' x 28' x 7'6"; 240 gross tons.

Hulls Nos. 2012-2021, ten welded steel car floats, for Pennsylvania R. R., Philadelphia, Pa. 250' x 34' x 9'1"; 5940 gross tons.

Hulls Nos. 2022-2030, nine welded deck barges, for Erie R. R. 100' x 30' x 9'6"; 2088 gross tons.

Hull No. 2031, welded steel car float for Erie R. R. 250' x 34' x 9'1"; 594 gross tons.

Hulls Nos. 2032-2041, ten type W-7 welded coal barges for Weirton Steel Co. 175' x 26' x 11'; 4720 gross tons.

★ **Hull No. 2042, caisson,** for drydock for Bayonne Associates, Bayonne, N. J. 1330 gross tons.

★ **Hulls Nos. 2043-2058, sixteen welded steel coal barges** for Wheeling Steel Corporation. 10' x 26' x 10'8"; 9040 gross tons.

★ **Hull No. 2059, welded cargo box barge,** for Lone Star Cement Co., New York City. 180' x 40' x 9'6"; 607 gross tons.

★ **Hull No. 2060, caisson,** for drydock No. 2 at Charleston Navy Yard. 375 gross tons.

★ **Hull No. 2061, caisson,** for drydock No. 1 at Charleston Navy Yard. 520 gross tons.

★ **Hulls Nos. 2062-2065, four 165' submarine chasers,** for Bureau of Ships, Navy Department, Washington, D. C. 1340 gross tons.

ELECTRIC BOAT COMPANY

Groton, Conn.

New Construction:

Two submarines, SS206, Grampus; SS208, Grayback; for U. S. Navy. Cost $2,937,000 each. Keels laid, Grampus, February 4, 1940; Grayback, April 3, 1940.

One submarine, SS204, Mackeral, for U.S. Navy. Keel laid October 6, 1939. Launched September 28, 1940.

Three submarines, SS212, Gato; SS213, Greenling; SS214, Grouper; for U. S. Navy. Cost $2,957,000. Keels laid, Gato, October 5, 1940; Greenling, November 12, 1940.

Thirteen submarines, SS215, Growler; SS216, Grunion; SS217, Guardfish; SS218, Albacore; SS219, Amberjack; SS220, Barb; SS221, Blackfish; SS222, Bluefish; SS223, Bonefish; SS224, Cod; SS225, Cero; SS226, Corvina; SS227, Darter. Cost $2,795,000 each.

Twenty-five submarines, SS240-SS264.

THE FEDERAL SHIPBUILDING AND DRY DOCK COMPANY

Kearny, N. J.

New Construction:

Hulls Nos. 168-169, CL51, Atlanta; and CL52, Juneau; two 6000-ton cruisers for U. S. Navy. Keels laid April 22 and May 27, 1940. **Launching date,** No. 168, September 6; **No. 169, October 25, 1941.**

Hulls Nos. 180-186, seven C-2 cargo ships for U. S. Maritime Commission. Keel laid, No. 180, April 17, 1941. Launching date, No. 180, September 27, 1941.

Hulls Nos. 191-193, three tankers for Sinclair Refining Co. 15,000 dwt. Keel laid, No. 191, April 17, 1941. **Launching date, No. 191, October 21, 1941.**

Hulls Nos. 194-197, four destroyers for U. S. Navy. Keels laid, Nos. 194-195, December 2, 1940; Nos. 196-197, December 16, 1940. **Launching dates,** No. 194 and 195, July 26; No. 196 and 197, September 26, 1941.

Hulls Nos. 198-203, six destroyers for U. S. Navy.

Hulls Nos. 204-205, two destroyers for U. S. Navy.

Hulls Nos. 206-213, eight destroyers for U. S. Navy. Keels laid, No. 206 and 207, February 11; No. 208 and No. 209, July 31, 1941.

Hulls Nos. 214-218, five destroyers for U. S. Navy.

Hulls Nos. 219-221, three cruisers for U. S. Navy.

Hulls Nos. 222-227, six destroyers for U. S. Navy.

Hull No. 228, one C-2 cargo ship for U. S. Maritime Commission. Keel laid, February 10, 1941. Launched July 11, 1941. **Delivered September 17, 1941.**

Hulls Nos. 229-230, two destroyers for U. S. Navy.

Hulls Nos. 231-232, two destroyers for U. S. Navy.

Hulls Nos. 233-240, eight cargo ships for the U. S. Maritime Commission.

Hulls Nos. 241-264, twenty-four C-2 cargo vessels for U. S. Maritime Commission.

GREAT LAKES ENGINEERING WORKS

River Rouge, Michigan

New Construction:

Hulls Nos. 287-289, three bulk freighters for Pittsburgh S. S. Co. 640' x 67' x 35'; 18,000 dwt; 4000-hp steam turbine engines. Keel laying dates, No. 287, June 16; No. 288, July 1; No. 289, August 6, 1941.

HENRY C. GREBE & CO., IN

Chicago, Illinois

New Construction:

One 70' twin-screw diesel cruiser yacht.
Two 135' mine sweepers for U. S. Navy.
Five 65' steel harbor tugs.

GREENPORT BASIN & CONST. CO.

Greenport, L. I., N. Y.

New Construction:

Four coastal mine sweepers, AMC61-64, for U. S. Navy. **Delivered.**

Twelve 135' motor mine sweepers YMS 20-31, for U. S. Navy

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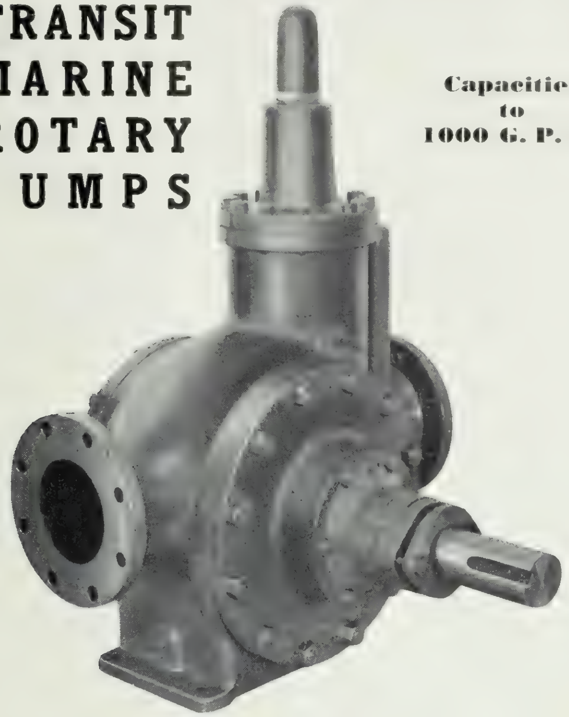

National Transit Pump & Machine Company
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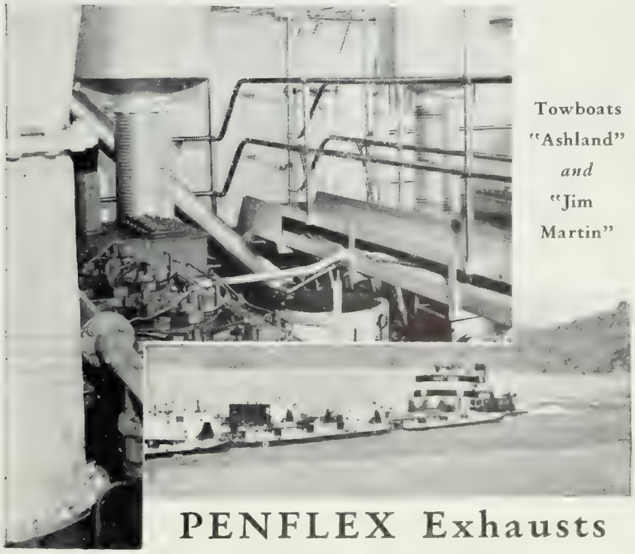

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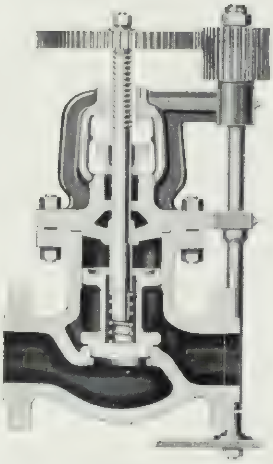

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THE EDWARD VALVE & MFG. CO., INC.
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EDWARD MARINE VALVES

STEEL STOP • CHECK • FEED-LINE • BLOW-OFF • NON-RETURN VALVES • ETC.

Fig. 40

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This job of arming America is no child's play . . . it demands the best from every man, every machine. The responsibility of providing industry with precision-built, hard working pumping equipment is a task Viking shoulders willingly and with extreme pride. If your production problem is pumps, perhaps Viking can lend a hand . . . write today for Viking specifications and prices.

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GULFPORT BOILER & WELDING WORKS, INC.

Port Arthur, Texas

New Construction:

Hull No. 187, oil barge for Butcher-Arthur Corp., Houston, Texas. 165′ x 36′ x 10′9″. **Delivered October 5, 1941.**

Hull No. 189, diesel tug for General Motors Corp. 100′ x 24′ x 12′4″; 1000 hp. **Delivery date, October 15, 1941.**

Hulls Nos. 190-194, five diesel-electric tugs, for General Motors Corp., Cleveland Diesel Engine Division. 100′ x 24′ x 12′4″; 1000 shp. **Delivery dates, No. 190, November 21;** No. 191, December 12, 1941; No. 192, January 20, 1942.

GULF SHIPBUILDING CORP.

Chickasaw, Ala.

New Construction:

Four 2100-ton destroyers for U. S. Navy.

Two cargo vessels for Waterman Steamship Corporation. 445′ x 63′ x 40′6″; shelter deck type; geared turbine drive; 15½ knots service speed.

Six 220′ mine sweepers, for U. S. Navy

Fourteen C-2-modified cargo vessels for U. S. Maritime Commission. 445′ x 63′ x 40′6″; shelter deck type; geared turbine drive; 15½ knots service speed.

HOUSTON SHIPBUILDING CORP.

Houston, Texas

New Construction:

Hulls Nos. 1-37, thirty-seven EC-2 cargo vessels for U. S. Maritime Commission. Estimated delivery dates, first, January 15, 1942; last, February 24, 1943.

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Shipbuilding and Drydock
Corporation

LOS ANGELES HARBOR . . . SAN PEDRO, CALIFORNIA

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THE INGALLS SHIPBUILDING CO.

Pascagoula, Miss., and Decatur, Ala.

Pascagoula

New Construction:

Hulls Nos. 268, 297-299, four C-3-IN passenger-cargo vessels for U. S. Lines. Completion dates, May, November, December, 1942; and February, 1943.

Hulls Nos. 265-267, three C-3-P passenger-cargo vessels for American-South African Line, Inc. **Completion dates, November,** December, 1941; and January, 1942.

Hulls Nos. 293-296, four C-3-S-A-2 cargo vessels for U. S. Maritime Commission. Completion dates, February, March, May and June, 1942.

Hulls Nos. 325-336, twelve C3-S-A2 cargo vessels for the U. S. Maritime Commission. 492′ x 69′6″ x 42′6″. Keel layings, from April 30 to December 31, 1943

Decatur

New Construction:

Hulls Nos. 343-344, two 39,000-bbl oil barges for Eddie Erlbacher, Cape Girardeau, Mo. 195′ x 35′ x 9′9″. Delivery date, December 10, 1941.

Hulls Nos. AN 1-4, four net layers for U. S. Navy.

Four 9,000-bbl oil barges for Standard Oil Company, Cleveland, Ohio. 195′ x 35′ x 9′9″. Delivery date, December 1, 1941.

Hulls Nos. 345-348, four 1300-bbl. oil barges, for Illinois Oil Company, Rock Island, Ill. 230′ x 40′ x 9′6″.

★ **Hull No. 349, derrick barge,** for U. S. Engineer Department, Galveston, Texas. 80′ x 40′ x 6′6″.

★ **Hulls Nos. 351-354, four cargo barges,** for Quartermaster Corps, U. S. Army. 210′ x 40′ x 15′.

GEORGE LAWLEY & SON CORP.

Neponset, Mass.

New Construction:

Twelve 45′ tank lighters for U. S. Navy.

Two 127′ fish trawlers for Booth Fisheries Co. Diesel powered.

Five boats for repair work for U. S. Navy.

Ten 165′ submarine chasers for U. S. Navy.

Conversion:

90′ launch Cutty Sark to U. S. Army launch Captain Dean C. Howard.

LEVINGSTON SHIPBUILDING CO.

Orange, Texas

New Construction:

Hull No. 185, ocean tug for U. S. Navy; 135′ x 30′ x 17′6″.

Hulls Nos. 194-195, two tugs for stock. 66′ x 17′ x 8′; 300-hp Atlas diesel.

Hulls No. 202, tug, for Pan American. 74′ x 20′ x 9′; 400-hp Atlas diesel.

Hull No. 203, coastwise tug for stock. 85′ x 24′ x 9′11″; 600-hp Atlas diesel.

Hulls Nos. 204-205; 207-210; six 8500-bbl oil barges for Pan American. 173′ x 8′6″ x 30′

Hull No. 206, tug, for River Terminals. 74′ x 20′ x 9′; 400-hp Atlas diesel.

Hull No. 211, tug. 105′ x 25′ x 9′6″; 1000 hp General Motors diesel

Hull No. 212, tug, for stock. 105′ x 25′ x 13′6″; 1000-hp General Motors diesel.

Hull No. 213, tug, for stock. 85′ x 23′ x 9′6″; 600-hp Superior diesel.

Hull No. 214, tug, for River Terminals Corp. 74′ x 20′ x 9′; 400-hp Atlas diesel.

Hulls Nos. 217-220, four 143′ ocean tugs for General Motors Sales Corp.

★ **Hull No. 215, U. S. S. Sea Otter II; cargo vessel,** for U. S. Government. 250′ x 40′ x 21′.

THE LUDERS MARINE CONSTRUCTION CO.
Stamford, Connecticut

New Construction:

Seven 65′ Naval tugs, YT160-YT169. Cooper-Bessemer diesel engines.

Two submarine chasers, PC505-PC506, for U. S. Navy.

Nine small subchasers for U. S. Navy.

Six 65′ all-welded steel, single-screw distribution box boats for Quartermaster Corps, U. S. Army. Diesel propelled.

Three 165′ steel subchasers for U. S. Navy. Keel laid, first vessel, July, 1941.

Four wooden subchasers for U. S. Navy.

MANITOWOC SHIPBUILDING CORP.
Manitowoc, Wisconsin

New Construction:

Ten submarines, SS265-274, for U. S. Navy.

MARIETTA MANUFACTURING CO.
Point Pleasant, W. Va.

New Construction:

Three net tenders, YN14-16, for the U. S. Defense Commission. Total cost $2,040,000. Launching dates, March 20, April 17, June 19, July 2, 1941. **YN14 delivered October 11, 1941;** remainder before January, 1942.

Hulls Nos. 474-489, sixteen all-steam propelled mine planters, for the U. S. Army. Cost about $12,000,000. Keel laying dates, No. 474, May 14; No. 475, May 20; No. 476, June 24; No. 477, July 11, 1941.

MARINE IRON & SHIPBUILDING CO.
Duluth, Minnesota

New Construction:

Hulls Nos. 70-72, three 180′ cutters of "Cactus" type for U. S. Coast Guard.

JOHN H. MATHIS CO.
Camden, N. J.

New Construction:

Four anti-submarine net tenders for U. S. Navy.

One bulk carrier tanker 265′ long for Thos. Bowes, N. A.

Three 220′ mine sweepers for U. S. Navy.

MIAMI SHIPBUILDING CORP.
Miami, Florida

New Construction:

Thirty-five high-speed, off-shore patrol boats.

NEWPORT NEWS SHIPBUILDING & DRYDOCK CO.
Newport News, Va.

New Construction:

Hull No. 378, battleship 58, Indiana, for U. S. Navy. Keel laid November 20, 1939.

Hull No. 385, aircraft carrier No. 8, Hornet, for U. S. Navy. Launched December 14, 1940.

Hull No. 386, single-screw combination passenger and cargo vessel for U. S. Maritime Commission. 465′ x 69′6″ x 42′6″; gross tonnage about 9100 tons. **Delivery date, November, 1941.**

Hulls Nos. 390-391 (CL62-CL63), two light cruisers for U. S. Navy.

Hulls Nos. 392-394 (CV9-CV11), three aircraft carriers for U. S. Navy.

Hulls Nos. 395-398 (CV12-CV15), four aircraft carriers for U. S. Navy.

Hulls Nos. 399-400 (CL80-CL81), two light cruisers for U. S. Navy.

THE NEW YORK SHIPBUILDING CORPORATION
Camden, N. J.

New Construction:

BB57, South Dakota, battleship for U. S. Navy. Keel laid July 5, 1939.

AR5, Vulcan, repair ship for U. S. Navy. Keel laid December 26, 1939.

CL55, Cleveland; and CL56, Columbia; two cruisers for U. S. Navy. Order placed March 23, 1940.

CL57 and CL58, two cruisers for U. S. Navy. Order placed June 12, 1940.

AV7, Currituck, seaplane tender for U. S. Navy.

CL59-CL61, three cruisers for U. S. Navy.

CB1-CB6, six cruisers for U. S. Navy.

CL76, four cruisers for U. S. Navy.

NORTH CAROLINA SHIPBUILDING CO.
Wilmington, N. C.

New Construction:

Hulls Nos. 1-37, thirty-seven all-welded steel EC-2 cargo vessels for U. S. Maritime Commission. **Keel laying dates,** No. 1, May 22; No. 2, May 22; No. 3, May 28; No. 4, August 22; No. 5, September 3; No. 6, September 4; **No. 7 October 12; No. 8, October 21, 1941.**

THE PUSEY & JONES CORP.
Wilmington, Del.

New Construction:

Hull No. 1076, C-1A cargo ship. Launched September, 1941. Delivery date, December, 1941.

Hulls Nos. 1082, Hains; and 1083, Hoffman; two seagoing hopper dredges for War Dept., U. S. Engineers Office, Philadelphia, Pa. 215′10½″ x 40′ x 15′6″; approx. 2000 gross tonnage; diesel-electric propulsion, 950 shp. Delivery dates, February and August, 1942.

Hulls Nos. 1084-1093, ten C-1A type cargo ships for U. S. Maritime Commission. 412′3″ x 60′ x 37′6″; 9000 dwt; 4000-hp steam turbine propulsion.

R. T. C. SHIPBUILDING CORP.
Camden, N J.

New Construction:

Hull No. 136, 1700-ton motor tanker, T. W. Drennan. 260′ x 42′ x 18′ Launching date, July 19, 1941. **Delivered, October 2, 1941.**

Hull No. 137, 995-ton motor tanker. 190′ x 36′ x 12′.

Hulls Nos. 138-139, two 985-ton motor tankers. 190′ x 36′ x 12′.

SOUTH PORTLAND SHIPBUILDING CORP.
Portland, Maine

New Construction:

Hulls Nos. 201-216, sixteen EC-2 type cargo vessels, for U. S. Maritime Commission.

SUN SHIPBUILDING AND DRY DOCK COMPANY
Chester, Pa.

New Construction:

Hulls Nos. 199-206, eight C-2 cargo vessels for U. S. Maritime Commission. 474′ x 63′ x 40′6″; 7400 gross tons; diesel propelled; 7500 shp; 16 knots. **Launching dates,** No. 199, May 24; No. 200, June 21; No. 201, July 26; No. 202, August 23; No. 203, September 20; **No. 204, October 18;** No. 205, December 6, 1941; No. 206, January 14, 1942. **Delivery dates,** No. 199, September 25; **No. 200, October 15; No. 201, October 30;** No. 202, December 1; No. 203, December 15; No. 204, December 31, 1941; No. 205, February 10; No. 206, March 15, 1942.

Hulls Nos. 213-216; 219-220, six tankers for Panama Transport Co. 547′3″ x 70′ x 40′; 11,400 gross tons; 7500 shp; 15 knots speed. Launching and delivery dates, 1942-1943.

Hulls Nos. 217-218, two tankers for Standard Oil Co. of N. J. 547′3″ x 70 x 40′; 11,400 gross tons; 7500 shp; 15 knots speed. Launching dates, No. 217, August 2; No. 218, September, 1941. **Delivery dates, No. 217, October; No. 218, November, 1941.**

Hulls Nos. 221-222, two tankers for Keystone Tankship Corp. 520′ x 68′ x 37′; 10,600 gross tons; turbine; 12,000 shp; 16½ knots. Keel laying dates, No. 221, June 12; No. 222, September 11, 1941. **Launching dates, No. 221, October 4, 1941.** No. 222, January 10, 1942. Delivery dates, No. 221, December, 1941; No. 222, March, 1942.

Hulls Nos. 223-225, three tankers for The Texas Co. 513′10″ x 68′ x 36′; 9300 gross tons; turbine; 9000 shp; 16 knots. Launching and delivery dates, 1942.

Hull No. 226, tanker for Kaymar Tankship Corp. 520′ x 68′ x 37′; 10,600 gross tons; turbine; 12,000 shp; 16½ knots. Keel laying date, December, 1941.

Hulls Nos. 227-228, two tankers for Seamar Tankship Corp. 520′ x 68′ x 37′; 10,600 gross tons; turbine; 12,000 shp; 16½ knots. Keel laying dates, 1942.

Hull No. 230, tanker for Atlantic Refining Co. 474′ x 65′ x 37′; 8000 gross tons; turbo-electric; 5000 shp; 14½ knots. Launching date, September 19, 1941. Delivery date, 1942.

Hulls Nos. 231-232, two tankers for Keystone Tankship Corp. 520′ x 68′ x 37′; 10,600 gross tons; turbine; 12,000 shp; 16½ knots. Delivery date, 1942.

Hulls Nos. 233 and 240, two tankers for Gulf Oil Corp. 485′ x 68′ x 36′; turbine propelled; 14½ knots. Delivery dates, August, 1942, and December, 1942.

Hull No. 234, tanker for Sun Oil Co. 547′3″ x 70′ x 40′; 11,400 gross tons; diesel propelled; 7500 shp; 15 knots. Delivery date, 1942.

Hulls Nos. 235 and 237, two tankers for Standard Oil Co. of N. J. 547′3″ x 70′ x 40′; 11,400 gross tons; turbine; 7500 shp; 15 knots. Delivery date, 1942.

Hull No. 236, tanker for Atlantic Refining Co. 543′10″ x 70′ x 40′; 11,600 gross tons; turbo-electric; 5000 shp; 13 knots. Delivery date, 1942.

Hulls Nos. 238-239, two tankers for Standard Oil Co. of Calif. 521′ x 70′ x 40′; turbine propelled; 15½ knots. Delivery dates, November and December, 1942.

Hulls Nos. 241-312, seventy-two tankers.

TAMPA SHIPBUILDING CO.
Tampa, Fla.

New Construction:

Hulls Nos. 37-40, four C-2 type cargo vessels for U. S. Navy. 459′ x 63′ x 31′6″; 9291 dwt tons.

Three destroyer tenders, Piedmont, Sierra and Yosemite.

TODD-BATH SHIPBUILDING CORP.
Bath, Maine

New Construction:

Hulls Nos. 1-30, thirty cargo vessels for British Purchasing Commission. Cost $50,000,000. Keel laying dates, No. 1, May 24; No. 2, June 4; No. 3, June 18; No. 4, June 18; No. 5, August 2; No. 6, July 16; No. 7, July 25, 1941.

F. B. WALKER & SONS
Pascagoula, Mississippi

New Construction:

One all-welded steel tug for Florida interests. 68′ x 17′ x 8′6″; 300-hp Atlas diesel.

One all-welded steel tug for Colle Towing Co. 75′ x 19′ x 9′; 400-hp Atlas diesel.

One all-welded steel barge, 132′x32′x8′6″.

Two all-welded steel oil barges, 180′x36′ x 9′.

Two steel tugs, 75′ x 19′ x 8′6″.

WHEELER SHIPYARDS, INC.
Brooklyn, N. Y.

New Construction:

Ten bomb target boats for U. S. Navy.

Forty 83′ cutters for U. S. Coast Guard. Cost $42,500 each.

Twelve large wooden mine sweepers for U. S. Navy.

NEW STANDARD OIL TANKERS

Two more ships will shortly be added to the fleet of the Standard Oil Company of New Jersey. These vessels are the Esso Albany and Esso Trenton, successors to ships previously so christened but subsequently acquired by the Navy and renamed U. S. S. Sabine and U. S. S. Sangamon.

The new Esso Albany was launched by the Sun Shipbuilding and Dry Dock Company at Chester, Pa., on August 2, sponsored by Mrs. G. W. Gordon. The Esso Trenton was christened at the same yard by Mrs. C. H. Lieb on September 6.

The particulars of these two sister tankers are given in the table herewith.

Principal Characteristics

Length between perpendiculars	500′
Breadth molded	68′
Depth molded	37′
Draft, molded, to summer freeboard mark	29′11⅝″
Deadweight capacity	16,400 tons
Displacement	21,800 tons
Capacity of cargo oil tanks	138,520 bbls. 42's
Shaft horsepower	9,000
Speed	15.5 knots

The vessels are constructed on the longitudinal framing system, the hulls having cruiser form sterns with flared bows. There are two steel masts, the foremast being equipped with two cargo booms, each of five tons capacity; and there are two steel kingposts amidships. Each ship carries four 22-foot metallic lifeboats.

The ships are built and equipped in strict conformity with the existing regulations of the Bureau of Marine Inspection and Navigation, the American Bureau of Shipping, the regulations of the U. S. Public Health Service and other requirements for petroleum carriers.

The navigating facilities include installation of Sperry gyro compass and gyro steering control; Fathometer; RMCA radio and auto alarm equipment.

Propulsion

The propelling machinery for each vessel consists of a high-pressure ahead turbine and a low-pressure ahead turbine in series, transmitting power to the propeller through double reduction gearing. The astern turbine is incorporated in the low-pressure turbine casing. The turbines are of the latest design, impulse type, as manufactured by the General Electric Company. The double reduction gears are also of General Electric manufacture.

The turbines are designed to deliver, for normal operation, 9000 shp to the propeller at 90 rpm when supplied with steam at 435 lbs. gage pressure and 730° F. total temperature at the steam chest of the turbine, and exhausting at 28¼″ vacuum in the condenser, while steam as required is extracted for feed water heating. The astern turbine develops, for continuous operation, 80 per cent of the normal ahead torque at 50 per cent of the normal ahead rpm with normal ahead steam flow. The reduction gears are of the double helical fine-pitch type.

Boilers

Steam is supplied on each ship by two Babcock & Wilcox two-drum express-type watertube boilers, each of 5250 sq. ft. of heating surface and 1347 sq. ft. of economizer heating surface, fitted with superheaters and desuperheaters. Each boiler under maximum conditions is suitable to supply 54,197 lbs. of superheated steam per hour at 450 lbs. gage pressure and 764° F. steam temperature at the superheater outlet. The boilers are fired by Todd "Hexpress" burners.

The steam pressure and furnace conditions are controlled automatically by means of a boiler draft control and a combustion control system.

There are three horizontal, two-stage, double inlet on the first stage, bronze body and bronze rotors, hydraulically balanced centrifugal main cargo pumps installed in the cargo pumproom. They are driven by electric motors in the engine room, to which they are connected by means of a solid coupling, a floating shaft and a flexible coupling.

The electrical system consists of two 240-volt dc, 400 kw steam turbo-generators and 150 kw port service turbo-generator located on the generator flat.

* * *

Old Cut Nails Back

An old New England company, The Tremont Nail Company of Wareham, Massachusetts, humorously described back in 1819 as "a mill builte on a stream tyed to a tree to prevent it from being washed away by the Springe freshet," has gone back to making the kind of nails made in early Colonial days, J. S. Kenyon, president of the company, announced recently.

"We're turning the clock back more than a hundred years for this addition to our business because we believe our forefathers made better nails," Mr. Kenyon said. "The nails will be square cut out of genuine wrought iron just as they were in the old days." Tests show these old nails had greater resistance to corrosion and 72 per cent more holding qualities than the steel wire nails generally used today.

Mr. Kenyon went on to say that his company was now large enough to quell any fears that spring rains might wash it off downstream.

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McNAB OF BRIDGEPORT, INC.
Bridgeport, Conn.

Anchor Type Elastic Stop Nuts

(Continued from page [illegible])

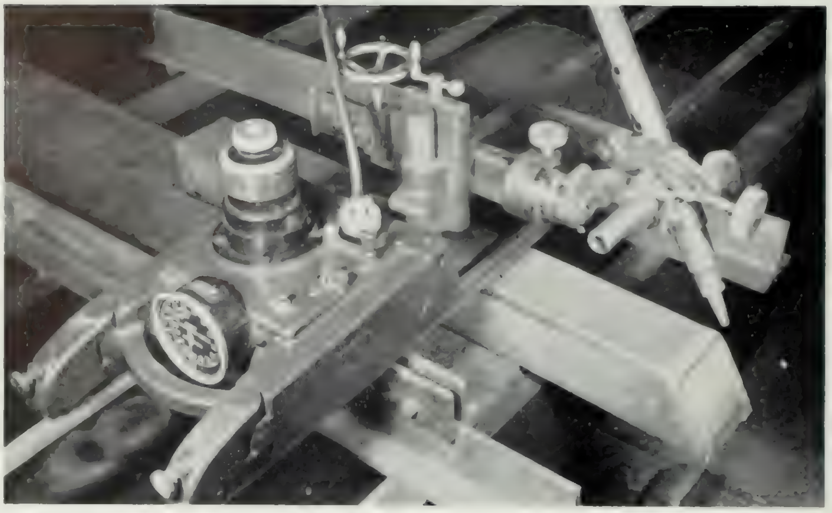
of the structure. The bolts, which are inserted from the outside, pass first through the removable plate, thence through the structure into the stationary nuts.

These nuts are offered in a wide range of size, material, and thread system, every nut incorporating the basic Elastic Stop self-locking feature, a fiber locking collar which is an integral part of each nut. This locking fiber prevents the bolt from becoming loose after it is installed in the nut, regardless of the severity of the vibration to which it is subjected. In such mountings, the bolts may be removed and replaced many times, the anchor nuts retaining their locking ability because of the resilient character of the fiber collar. It is pointed out, too, that the fiber of the collar, being softer than the metal of the screw, cannot damage the threads of their plated surfaces.

As with other Elastic Stop Nuts, when the end of the bolt enters the unthreaded collar, its passage is resisted, thus immediately and automatically eliminating all play between the threads of bolt and nut, and establishing contact of the load-carrying threads under pressure. Further turning and tightening of the bolt impresses a thread in the fiber collar, creating a moisture-tight seal around the bolt and maintaining the thread contact with a resilient grip. The braking action of the collar itself serves further to prevent any backing out of the screw.

Protractor Type Torch Holder

Extra convenience and accuracy in setting Radiagraph cutting torches for any desired angle of cut is now made possible by the new Protractor Type Torch Holder, just introduced by Air Reduction. As an example of the type of work for which the accuracy and time-saving features of the new holder are particularly valuable, a bevel cut billet is shown in the photograph. A circular knurled knob permits angular adjustment, as shown on the scale. The new holder which has a 90° angle range can be attached to any standard Airco Radiagraph.



Airco protractor type torch holder

Unsinkable Life Raft Developed in Sweden

A unique pontoon raft for merchant ships has been developed by a Stockholm engineer. Capable of carrying 20 to 24 persons, the craft, built either of steel or of some light alloy, measures about 15 feet in length and 6 feet in width, while the greatest inside height is 5.1 feet. It is divided into six separate, water-tight compartments, fitted with eight bunks in all. The float is completely decked. There is a double bottom running under the entire craft. The ballast tanks within this double bottom are used to store fuel oil, provisions, fresh water, and accumulator batteries for the radio, telephone, and light plant.

It is the plan of the inventor, Captain Swen Lundberg, that the raft shall have its place on the forward deck of a merchant vessel. If the ship should be torpedoed or strike a mine, run aground or develop a leak in a heavy storm, and sink, the crew enter the raft through six manholes, three along the starboard side and three along the port side. They then close these openings after them from within. A large ship naturally will require several rafts in order to accommodate every member of the crew.

As the ship gradually disappears under the water, the raft, because of its great buoyancy, frees itself from the deck, and floats away. If the weather is calm, the manholes can later be opened, and the raft be rowed like an ordinary life boat. Exhaustive experiments, however, have proved conclusively that regardless of weather conditions, the construction of raft makes it impossible to capsize, and that it will always right itself with or without a crew on board.

The raft offers much better protection than the open life boats now in use. It is insulated against the outside cold; the crew can change into dry clothes, and even brew soup or coffee for themselves on an electric stove. Fresh air is supplied by means of ordinary ventilators. If the weather is bad, and the ventilators have to be closed, air is forced into the cabins by a special compressor. In addition, the raft is fitted with a motor-driven pump, which ejects water through a revolving nozzle that can be used both as a propeller and a rudder. If made of steel, the raft weighs about 5600 pounds. The cost per unit, without the propelling pump arrangement and the radio, is about $1000.

Columbia Steel Increases Capacity

Columbia Steel Company, subsidiary of United States Steel Corporation, has furnished details of its program to increase the capacity of its Pittsburg, California, plant, which will place it in a stronger position to meet the demands of national defense.

The program includes the addition of a new semi-continuous rod mill together with billet heating furnaces, rod cooling and handling equipment. The rod mill will be housed in a new building to be built east of the plant's open hearth building.

The plant's wire and nail mill will be improved and extended to include

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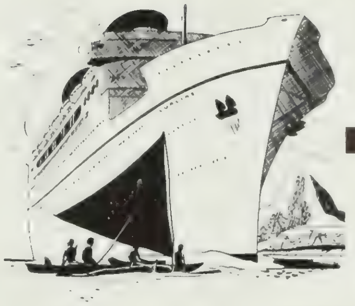

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additional wire drawing and nail machines, and new facilities for the manufacture of some wire products, the production of which was formerly confined to Eastern mills. Warehousing facilities of the wire mill also will be increased.

Some changes also will be made to the primary rolling mills allowing production of longer rod billets.

The steel making capacity of the Pittsburg plant is being increased to the extent of 77,000 tons of ingots annually by the installation of a new open hearth furnace and by an increase in the capacity of the four existing open hearth furnaces. The program will require extension of the plant's open hearth building, the addition of new ladles, an additional ladle crane, and a new charging machine.

Large Surface Plate

Cast in semi-steel and finished plane with .005 in., this large surface plate recently announced by the South Bend Tool and Die Co., offers seven specific support-points for utmost flexibility in usefulness. Two sizes of adjustable blocks or legs (10 in. and 12 in.) provide possible working-surface heights between 29 in. and 33 in. The blocks support threaded 1½ in. screws, each topped with a circular cap which is recessed to contain any of the projecting support-points on the bottom of the plate. A 12-pitch thread provides fine adjustment to compensate for floor irregularities, etc. Five of these blocks are provided with each surface plate.

The ribbed under side of the plate is designed to provide maximum strength without excessive weight. The surface plate weighs 3 tons. The under side of the plate is painted red, the blocks green.

Originally made by the company for use in their own factories, the surface plate is now offered as a standardized product for machine shops, tool and die makers, and large tool rooms.

Heavy Duty Electric Range

Recently introduced by Associated Products, Inc., Akron, Ohio, is the new Akron "Kitchen-King" commercial electric range. Sectionally constructed, the cooking surface and bake oven may be purchased separately for adaptability to any requirement.

The top unit is divided into three 12" x 24" cooking surfaces—each half section controlled with separate three-heat switches, permitting flexibility and economy of operation. Any heat combination for baking or roasting is provided with separate three-heat switches controlling top and bottom oven units. There is a pilot light for the cooking surface and the oven circuit.

Fast and efficient, the "Kitchen-King" offers all the advantages of automatic electric cooking at a moderate price.

Pneumatic Impact Wrenches

Ingersoll-Rand Company announces the Size 534, a new and improved, air-operated impact wrench for use in applying and removing nuts up to 1¾" bolt size.

It is designed with the patented Pott impact wrench principle which localizes the steel to steel impact without transmitting shock to other parts of the tool. Reversing gears are not used. A small nose diameter and short overall length permits operation in close places.

Smooth, balanced power with negligible torque reaction makes possible safe and convenient one-hand operation.

This tool is ideal for use in shipyards, oil refineries, chemical plants, steel construction and general repair shops. The complete line now includes five sizes for applying and removing nuts from ¼ to 1¾ inch bolt sizes.

Size 534 has 635 rpm average working speed at 90 psi. Its weight is 27¼ pounds. It is operated by a ¾-inch hose. Length of the wrench without chuck is 18$\frac{5}{16}$ inches.

Convenient Chain "Vistand"

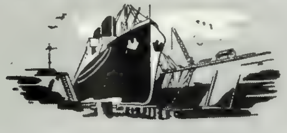
The new heavy-duty Vistand with Integral Chain Vise, announced by the Armstrong Mfg. Co., is the huskiest equipment of its kind yet offered by that company. At the same time, it is light enough to be easily portable and is well balanced, being designed to prevent tipping or tilting. It has spreads of 50 inches in front and 43 inches from front to rear leg. The platform measures 14 inches in both width and depth and has notches and slots for tools around the rim. It is also equipped with three benders—one for ¾" pipe, and reverse benders for ½" and ¾" pipe—placed directly over the right front leg to guard against tipping during the bending operation.

The "dope" pot, cast into the platform, is round and big enough to hold a one-pound can of thread dope. Three equidistant lugs, cast on the rim of the oil can recess, prevent the can from joggling or slipping off without adding the extra weight of a deeper rim.

An adjustable ceiling brace screw is another feature, and the unit's feet are punched for attaching to the floor—or Armstrong-Bridgeport's rubber "shoes," which prevent scratching or skidding on polished floors, may be used.

The business part of the vise—the jaw—is outstanding. The teeth are accurately spaced to hold each size of pipe and each tooth is cut to prevent it from filling up with scale.

TODD SHIPYARDS



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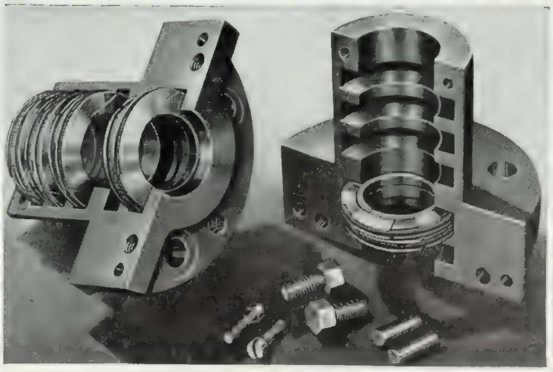

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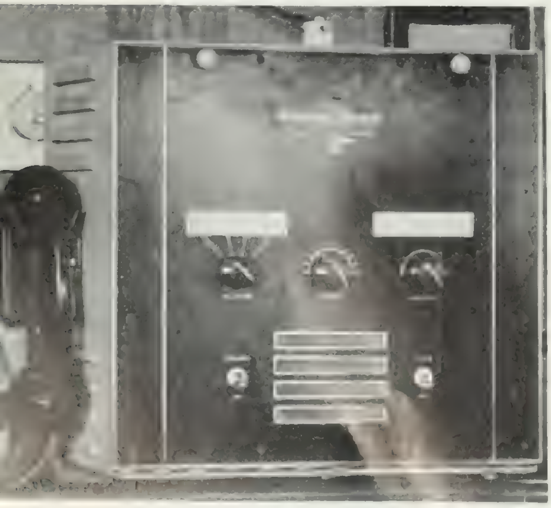
Two Sterling Rear Admiral fresh-water cooled engines propel this U. S. Navy bomb target boat

Sterling Engines in the Defense Program

The Sterling Engine Company of Buffalo, New York, is producing four of its engine types for the Defense Program. Its chief customer is the U. S. Navy which has placed a large order for the Sterling Admiral, the most powerful engine ever built by this old-time engine manufacturer. The Admiral would cost a private purchaser about $23,000, but the Navy and British aren't saying just what they pay, although the Navy considers it so important that they contracted with Sterling for a brand new $450,000 plant addition, which will be used to house an assembly line for Admirals. Incidentally, three Admiral engines are used to power motor torpedo boats.

Large orders, now in the process of rapid production, have been placed for Viking 8-cylinder engines being used in 43 new U. S. Coast Guard Patrol boats, also a part of the Defense Program. Sterling Dolphins are going into Navy aircraft rescue boats, and the smaller Petrels into Coast Guard Picket Boats and Army aircraft rescue boats.

Sterling has a $13,000,000 backlog of U. S. and British orders.



Above: The Moran Towing Co. tug Barryton. At left: The marine radio telephone set by which she keeps in touch

A Modern Tug Radio Telephone

The 150-foot diesel tug Barryton, operated by the Moran Towing Co., New York, relies on a Western Electric 226C marine radio telephone for dispatching orders and reroutings. A firm tie to the land in emergencies and an aid to efficient operations, the marine radio telephone is becoming indispensable to the towboat industry. The radio telephone on this tug has a power output of 25 watts and features crystal control in both receiver and transmitter on any one of four predetermined frequencies. Three of these may be utilized for ship-to-shore communication and the fourth reserved for ship-to-ship or Coast Guard calls. Only three control knobs appear on the panel and the transmitter goes on the air instantly at the pressure of a finger on the handset button.

The radio receiver is of the superheterodyne type embodying the latest developments in circuit design. The handset, when not in use, rests on a small hanger on the side of the cabinet. Returning the handset to its hanger automatically prepares the receiver for the next incoming call. A built-in loudspeaker monitors incoming calls.

A New Quickly-Reversible Motor

For use on cranes, hoists, lathes and many other industrial applications where instantaneous reversing is necessary, a new capacitor-start reversing motor is announced by Westinghouse Electric and Manufacturing Company.

Available in ratings of from 1/6 to 3/4 horsepower, single phase 60 cycle, the motor operates at 1725 rpm on 115 and 230 volt circuits. To reduce maintenance, no brushes or commutators are used.

In operating, the drum switch is closed setting up a power circuit through the solenoid relay and the motor windings. The relay transfers the circuit from the lower to the upper contact and locks the relay across the line. Line voltage across the motor main and starting windings starts the motor. The centrifugal-starting switch opens at a predetermined speed to disconnect the starting windings and the motor operates on the main winding as an ordinary single-phase induction motor.

To reverse the motor it is simply necessary to throw the drum switch to the other side, and a similar sequence of operations takes place.

Greater torque during the starting and accelerating period is obtained since the capacitor is placed immediately on the auxiliary winding circuit.

146
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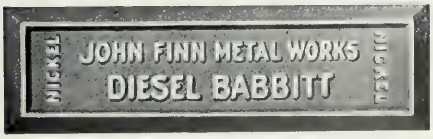

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HOT off the PRESS

The Catalogs of Today Become the Technical Handbooks of Tomorrow

Organic Methods, new fourth edition of the D. W. Haering and Company booklet on "Organic Methods of Scale and Corrosion Control," is just off the press. Largely rewritten and enlarged to accommodate additional information, this new twenty-eight page discussion of organic methods presents the newest information on scale and corrosion control.

Celebrating their tenth anniversary, the Haering organization has incorporated a number of charts, graphs, tables and half tones to illustrate the usefulness of organic chemicals in water conditioning and point the way to substituting these efficient and available chemicals for products which are now obtainable with difficulty, if at all.

This new edition includes an explanation of causes of scale and corrosion and introduces a new section tabulating the physical and chemical properties of the various glucosates developed by Haering Research.

* * *

Deaerators. Outstanding in the new Cochrane 36-page deaeration catalog (Pub. 3005, the Cochrane Corporation), is the comprehensive treatment of tray-type deaerators, atomizing deaerators, deaerating hot water generators, and cold water deaerators in one publication. An interesting feature for those employed in power plant design is a section of flow diagrams including photographs of the actual units described. A supplementary appendix on corrosion control and pH control is included.

Line diagrams in three colors clarify the operating features of the Cochrane deaerator, further explained by cross-sectional photographs. Special pages are devoted to the various designs that are constructed to meet space limitations and operating requirements. A special section explains metering deaerators equipped with V-notch recorders and electrical systems for recording flow at a distance, when the recorder is desired on a centralized panel-board. Details of accessory equipment are included, with illustrations and drawings to show the importance of these accessories in maintaining trouble-free operation of the entire power plant.

* * *

New Spring Alloys for Tough Jobs. This new booklet, which reports in detail on the value of five different metals for spring purposes under conditions which involve exposure to corrosion as well as to high and low temperatures and other severe service, has been published by The International Nickel Company.

The five metals included are the two heat-treatable alloys "Z" nickel and "K" Monel, and Monel, Inconel, and malleable nickel. Three of the booklet's twelve pages are devoted to illustrations and actual service records of springs made of the five metals. Three additional pages contain technical data and tables on strength, stiffness, endurance, resistance to corrosion and corrosion fatigue, effects of high temperatures, and magnetic and electrical properties.

* * *

Flexarc A-C Welders. Welders for every type of welding job, ranging from light gage sheet to sustained, heavy duty industrial fabrication, are described in a new 8-page bulletin (B-2285 department 7-N-20), published by Westinghouse Electric and Manufacturing Company. Current ranges of these welders are from 20 to 625 amperes.

Improvement in ac welder construction are discussed with a note on new type electrodes. Hints on the selection of ac welding equipment include descriptions and ratings of the units. The bulletin is well illustrated to make explanations of the welder parts easy to follow.

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EVERY facility and appointment of the Clark has been planned to afford its guests a maximum of comfort and convenience. Large enough to house a thousand people, yet small enough to permit personal service and friendliness to be truly emphasized.

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A copy of bulletin B-2285 may be secured from Department 7-N-20, Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pennsylvania.

* * *

New Welding Equipment. Equipment and supplies for use in arc welding are described in a new 11-page bulletin (Section 26-620, Department 7-N-20), announced by the Westinghouse Electric and Manufacturing Company.

Several types of electrode holders are described and a general discussion gives the major requirements for a good all-around electrode holder.

FlexArc helmets, handshields, superfilter lenses, and protective clothing, such as gloves, aprons and sleevelets, made of chrome leather are described.

Cable connectors of from 200 to 500 ampere sizes are discussed.

Illustrations of all items and tabulations giving sizes, order numbers and prices are included.

* * *

WANTED: Combination Naval Architect and Marine Engineer for research exclusively.

Prefer man now employed. Must be thoroughly educated, experienced in design and progressive in ideas. Give references, experience and salary in first letter. Large established shipbuilding company.

Address Box 818, Pacific Marine Review, 500 Sansome St., San Francisco

Thermocouple Data Book and Catalog. Bulletin No. S2-3 of the Wheelco Instruments Co. is said to be the most complete compilation of data ever published for thermocouple users.

Its 32 pages contain such valuable information as temperature conversion tables, millivolt tables, pipe and wire sizes, decimal equivalents, wire resistances, recommendations for checking thermocouples and pyrometers, and information on how to construct thermocouples.

Prices and descriptions are given on the complete line of thermocouples and thermocouple accessories, thermocouple wire, lead wire, heads, connectors, plug and socket assemblies, insulators and protecting tubes. Recommendations and information given are presented as concisely as possible. Thermocouples can be selected and ordered direct from this book.

* * *

Ilg Unit Heaters. Because the heavy demands of national defense are imposing a terrific burden on operating equipment, the quality construction of Ilg Unit Heaters is featured in a new 36-page catalog just issued by the Ilg Electric Ventilating Co.

The catalog is a colorful presentation of the advantages of unit heaters over radiators and steam coils for heating the "vital zone" where people work, shop and play. Features of the Ilg construction are fully illustrated and described, followed by illustrations and data on four lines of unit heater models.

Helpful engineering data, including tables, illustrations pointing out the proper location of units in various types of buildings, piping diagrams, etc., fill the remaining pages in this complete buying manual.

FOR SALE—Two new 500 H.P. Triple Expansion Marine Engines complete with thrust bearings. For particulars inquire Marine Electric Company, 2121 N. W. Thurman, Portland, Oregon.

* * *

Miniature Panel Instruments. Miniature ac and dc voltmeters and ammeters in the two-inch classification for general use are described in a new 12-page bulletin (Catalog Sect. 43-330 Department 7-N-20) announced by Westinghouse Electric and Manufacturing Company. Full scale readings on the dc ammeter series are from 20 microamperes to 100 amperes and on the ac units, from 5 milliamperes to 50 amperes. Voltmeter calibrations are from 5 millivolts to 1000 volts full scale on both ac and dc lines.

Permanent white dials, interchangeability of parts, and high overload capacity are among the features discussed. Operation and construction are described with a note on repulsion vane types for ac circuits.

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There are Exides for every type and size of vessel . . . all built for absolutely dependable service under every condition afloat. Combined with the long, low-cost service they give, and their reasonable prices, this makes Exide a money-saving investment . . . aboard the smallest vessel or the largest.

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Typical instruments are illustrated and cutaway views show construction details. A complete tabulation lists ratings, scale divisions, style numbers and list prices.

Kimballectric Horizontal Centrifugal Pumps. "The only centrifugal pump with the protection of the double seal and the flexibility of a rotatable discharge."

That's the title of a new Bulletin, No. 120-A, describing Kimballectric Horizontal Centrifugal Pumps, prepared by the Kimball-Krogh Pump Co., Division of the Food Machinery Corporation.

According to the manufacturer, a patented double seal eliminates the metal-to-metal contact between the impeller and the pump volute at the inlet and provides a positive wear-resistant water seal without appreciable wear to the impeller or subsequent loss of pump efficiency.

Ingenious yoke construction allows replacement of other equipment with Kimballectrics, in installations where pipe has previously been installed by permitting the discharge of the pump volute to be rotated to any desired angle.

Electrode Consumption Calculator. Cost of arc-welding electrodes can now be estimated rapidly for welding any type of joint on any thickness with either bare or coated electrodes by the use of this new 8-page booklet just published by Air Reduction. It tells just how many pounds of electrodes are required per linear foot of weld.

The calculator includes consumption figures for both bare and shielded arc electrodes on all metal thicknesses commonly employed in making fillet welds, square groove butt joints, V and U groove butt joints, bevel grooves and J grooves.

The amount of steel deposited per linear foot of weld is also shown. As a further aid on other joints not shown, the basic formulas used in these calculations are included.

Electric Coupling for Marine Service, Publication F-8635, Westinghouse Electric and Manufacturing Co., a six-page folder describing the use of the Westinghouse electric coupling for diesel engine marine propulsion drives. Printed in blue and black with profuse illustrations, this publication shows "What the coupling is and how it works." These couplings have become of especial interest to the marine fraternity since the Maritime Commission designed all of its geared diesel motorships with this type of coupling between the engine and the gears.

Fatigue of Metals, a fifty-page, paper-bound booklet, containing a well-illustrated and amply authentic paper on this subject in its relation to the designing engineer. The paper was prepared by D. C. Landau, Industrial Applications Engineer for the Nitralloy Corporation of New York. Mr. Landau brings together in concise form the results of an exhaustive study of the extensive research work on metal fatigue and presents a very useful book of "facts for the designing engineer." This booklet is published by the Nitralloy Corporation for free distribution.

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Pacific MARINE REVIEW

December 1941

On the
Job with
America's
Defense

MANUFACTURING

From belching smokestacks of our great Western empire comes proof of the all-out effort of our manufacturing industry to assist in America's defense.

It has been our privilege and pleasure to cooperate with these manufacturers—both small and large—in their rapidly increasing needs for cordage. From raw materials to finished product, both Tubbs and Portland Rope are constantly on the job with America's defense in scores upon scores of the West's vital factories.

The heritage of quality behind this rope that today plays such an important part in defense industries is an old story to the ship operator. For generations he has recognized the Tubbs and Portland Rope trademarks as standing for leadership in dependability and service.

Today, as always, we pledge that Tubbs and Portland Marine rope will always be made to the most exacting quality standards.

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EXTRA SUPERIOR MANILA
SAN FRANCISCO

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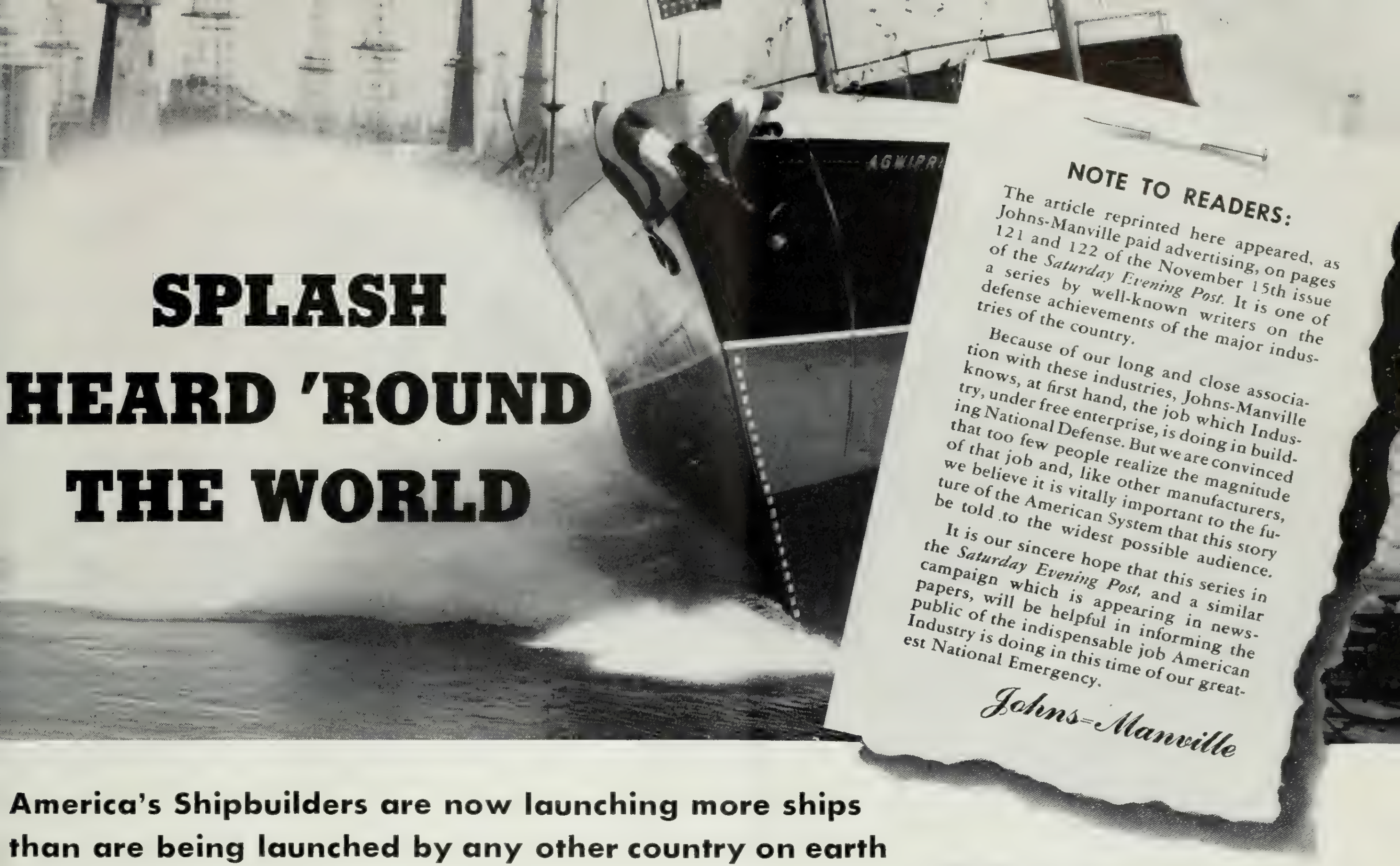
SPLASH HEARD 'ROUND THE WORLD



NOTE TO READERS:

The article reprinted here appeared, as Johns-Manville paid advertising, on pages 121 and 122 of the November 15th issue of the *Saturday Evening Post.* It is one of a series by well-known writers on the defense achievements of the major industries of the country.

Because of our long and close association with these industries, Johns-Manville knows, at first hand, the job which Industry, under free enterprise, is doing in building National Defense. But we are convinced that too few people realize the magnitude of that job and, like other manufacturers, we believe it is vitally important to the future of the American System that this story be told to the widest possible audience.

It is our sincere hope that this series in the *Saturday Evening Post,* and a similar campaign which is appearing in newspapers, will be helpful in informing the public of the indispensable job American Industry is doing in this time of our greatest National Emergency.

Johns-Manville

ANOTHER *10,000-ton freighter hits the water for Uncle Sam! Side-launchings, like this one in Southern California, are often used in narrow waters.*

America's Shipbuilders are now launching more ships than are being launched by any other country on earth

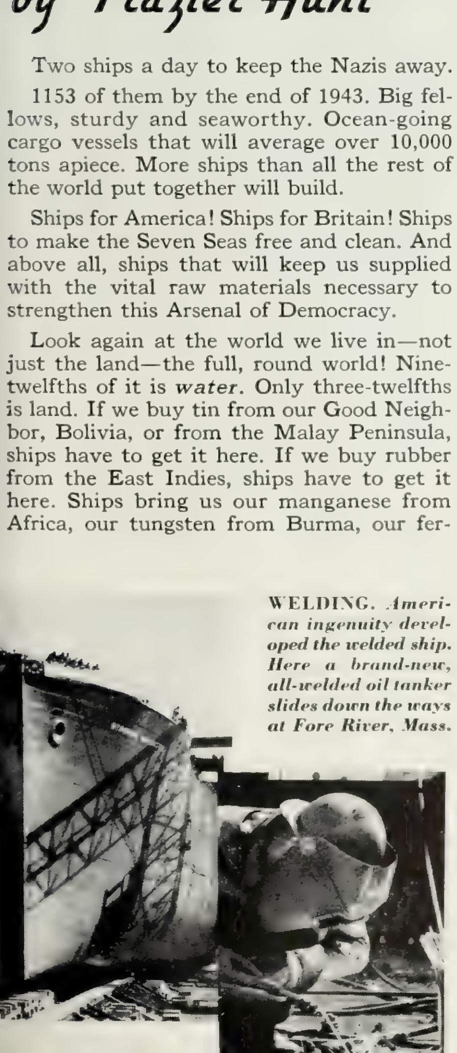
by Frazier Hunt

Two ships a day to keep the Nazis away.

1153 of them by the end of 1943. Big fellows, sturdy and seaworthy. Ocean-going cargo vessels that will average over 10,000 tons apiece. More ships than all the rest of the world put together will build.

Ships for America! Ships for Britain! Ships to make the Seven Seas free and clean. And above all, ships that will keep us supplied with the vital raw materials necessary to strengthen this Arsenal of Democracy.

Look again at the world we live in—not just the land—the full, round world! Nine-twelfths of it is *water.* Only three-twelfths is land. If we buy tin from our Good Neighbor, Bolivia, or from the Malay Peninsula, ships have to get it here. If we buy rubber from the East Indies, ships have to get it here. Ships bring us our manganese from Africa, our tungsten from Burma, our fertilizer from Chile and our breakfast coffee from Brazil. Merchant ships are the freight trains of the sea and more than *seven million tons* of Democracy's ships have been sunk since the liner *Athenia* was torpedoed in the North Atlantic on September 3rd, 1939!



WELDING. *American ingenuity developed the welded ship. Here a brand-new, all-welded oil tanker slides down the ways at Fore River, Mass.*

So we have set out to replace those seven million tons and *five million more.* Our program calls for the launching of better than 12,000,000 tons of cargo ships by the end of 1943. These 1153 vessels could almost literally "build a bridge" across the Atlantic with a ship stationed every three miles between the United States and England. Already, this year, production is 25% ahead of what was thought possible only last May. American shipbuilders now expect to launch 130 to 134 new merchant ships *this year.*

Private Enterprise—in Action!

Here is a thrilling story of American imagination, enterprise and daring—a story of how American shipbuilders took a neglected and half-forgotten industry and, by sheer energy and determination, electrified it with a spirit and a will that can be described by no other word save the wonderful word "Americanism."

For the entire 16-year period from 1922 to 1937, only two ocean-going cargo vessels were built in American shipyards. Today there are more than a hundred ships actually on our shipways. And there is another hundred in the assembly yards waiting to be put together. And a third hundred in the process of fabrication in the shops. Three hundred ships a-building at a time! And almost three times three hundred more waiting their turn.

One thing is certain: We aren't going to repeat the costly mistakes of 1917. We want our ships *now* and not post-war! And a crowd of go-getting, patriotic shipbuilders from one end of America to the other has thrown in their lot with the Maritime Commission and with its efficient head man, Admiral Emory S. Land, to bridge the Atlantic and help Britain, and guarantee our own precious Four Freedoms.

"We've got to work with the tools we've got, and we've got to build for *this* war," Admiral Land fairly barked at me in his office in Washington, D. C. "And what really happens to this Liberty Fleet depends on the productivity of labor. Our principal bottleneck was the scarcity of trained men. Why, we only had around 25,000 skilled men working in our shipyards last year, and we've 200,000 on new construction right now. We'll have to step that up to 500,000 next year; and before we're through we may have to use 750,000 men."

Ships Without Rivets

But if you think there is any doubt in the minds of our shipbuilders about their ability to build these ships by the hundreds—and by the thousands, if you insist—just come with me on a little jaunt around a few of our

(Continued on next page)

This is the fifth of a series of advertisements sponsored and paid for by Johns-Manville. For more than 80 years this company has been serving America's basic industries.

How indispensable these industries are to the American Way in time of peace is generally recognized. This series is to help inform the public of the indispensable job these industries are doing in this time of great National Emergency.

Johns-Manville is proud of the contributions its products are making in helping the Shipbuilding Industry, as well as other industries, produce defense material quickly and at the lowest possible cost.

JOHNS-MANVILLE

SPLASH HEARD 'ROUND THE WORLD

(Continued from preceding page)

major yards. Let's start at the Sun Shipbuilding and Drydock plant on the banks of the broad Delaware River at Chester, Pa. Here's one of the yards where giant ships are built without rivets—prefabricated vessels that are made in great 30- and 40-ton sections in the shops, and assembled on the shipways; "glued" together by a process of electric welding that saves thousands of man-hours and is said to make for stronger, tougher construction.

The Sun plant was built in 1917 to insure the parent Sun Oil Company a flow of tankers, and for all the years since 1919 John G. Pew has guided its destiny. Eight old Sun shipways have been busy turning out splendid modern tankers for private and government use. But this was not half enough, and today 12 new ways are being rushed, to build in record time eleven 10,000-ton cargo ships, and eighty-seven 16,300-ton tankers for the government, and an additional thirty-four tankers for private companies.

I stood among a crowd of shipworkers and their families while one of these beautiful new ships was slipping down the greased ways. It was a gala day—a day of sincere and happy celebration. A worker in his early thirties held high his little boy so that the child might see the great ship his father had helped build. The youngster's eyes were big and eager and proud.

"Ain't she somethin'?" the man said. "Ain't she a beauty? I helped build her, son."

She was *his* ship, *his* contribution towards making eternal the three great American dreams and truths—Life, Liberty and the Pursuit of Happiness.

For some reason it was not the giant shipways themselves that fascinated me most about the Sun shipyard. Rather it was the shops and the vast automatic plant where flat steel plates were bent and shaped, and then finally "butt-welded" into fluted bulkheads and frames. Giant overhead cranes lift these ship sections, 40 x 40 feet square, onto flat cars that carry them to the assembly yards, close to the ways. So it is that, for each ship on the ways, there was one building on the ground and a third being fabricated in the shops.

Ships without rivets! Sun is not alone in this trend. Other yards have pioneered in this method of shipbuilding and have reduced the number of rivets from, say, 1,150,000 per ship to around 100,000.

You get a different kind of thrill in the vast Bethlehem-Fairfield Shipbuilding yards on the Patapsco River, exactly eight miles south from the center of Baltimore. I found the story of the resurrection of this yard really began some fifteen miles away at Sparrows Point, Md. There, at Sparrows Point, Bethlehem already owned a modern shipyard in connection with its mighty rolling mills and factories. But when Admiral Land talked about "enlarging" Sparrows Point and turning out cargo ships by the score, the Bethlehem Shipbuilders allowed it would be better all around to build 'em where they wouldn't be cramped for space.

There were various advantages in expanding in that general area, but they also needed a yard with some elbow room! They found what they wanted eight miles from Baltimore—a yard that had not built a ship for twenty years. But this yard had no fabricating plants and shops—a lack which was quickly overcome by the discovery, less than two miles away, of a gaunt old building, 1800 feet long and 350 feet wide. It had been lying idle for 10 years, and Bethlehem leased it, lock, stock and barrel. These two "finds" together now make up the Bethlehem-Fairfield yard.

From One Yard—a Ship a Week

I gasped when I first saw the activity in the vast third-of-a-mile-long fabricating plant. Crude-steel plates came in at one end and steadily worked their way down three continuous lines to the distant rear. On that long journey they were fabricated into great welded sections. And then came the two-mile railroad ride to the assembly grounds and the ways where they would be turned into ships. By this December, all 16 ways will be finished and a 10,000-ton Liberty ship will slide down each shipway every four months; sixteen ships every sixteen weeks; a ship a week towards the "two-ships-a-day" goal. And that's making ships!

Every nook and corner, every waterway, fresh *and* salt, is busy, adding to the mighty launching "splash heard 'round the world." Along our entire coast line, master shipbuilders like Gulf Shipbuilding at Mobile, Consolidated Steel at Los Angeles and at Orange, Tex., Ingalls at Pascagoula, Miss., Moore Dry Dock at Oakland and Pusey & Jones at Wilmington, Del., are doubling and trebling their capacities. The same applies to Alabama Dry Dock at Mobile, Delta at New Orleans, Tampa Shipbuilding at Tampa, Fla., Western Pipe & Steel at San Francisco and Pennsylvania Shipyards at Beaumont, Tex.

Others—notably Todd Shipbuilding and Bath Iron Works—are combining their resources and years of shipbuilding experience for the building of new yards. Head men are contractor Henry J. Kaiser of Boulder Dam fame and shipbuilders John D. Reilly of Todd and William S. Newell of Bath. Already they have contracts for 60 emergency cargo vessels for the British and more than 200 cargo vessels for the Maritime Commission. This mushroom organization extends from the old Bath Iron Works and the new South Portland yards up in Maine, on down through the Todd drydocks and repair companies in Brooklyn, Hoboken, New Orleans and Galveston and the new yards at Houston —and then in a great swing jumps to the West Coast, to new yards at Los Angeles and Richmond, Calif., Portland, Ore., and Tacoma, Wash., and as far north as the repair yards at Seattle.

Now all I have said up to this minute has had to do with building merchant ships and tankers, because that is the chief subject of this article. But what good, under present conditions, are merchant ships without a Navy to protect them? Here, too, private industry is doing a job! Several of our very finest shipyards are completely occupied with Navy work. Such is the case with the huge parent yard of Newport News Shipbuilding & Drydock Company where the "America" was built and where this largest of our luxury liners was more recently re-fitted as the naval transport "West Point." This yard is turning out new battleships, cruisers and aircraft carriers, while a new subsidiary, the North Carolina Shipbuilding Company at Wilmington, N. C., is now at work on a contract for 37 emergency-type cargo vessels.

Exclusive Navy Contracts

A whole separate article could be written about New York Shipbuilding Corporation alone. They are now working exclusively on Navy contracts, have silently expanded far beyond their old limits and horizons and are doing a valiant job building new battleships, cruisers and auxiliary naval vessels.

Cramp Shipbuilding Company of Philadelphia is building six cruisers; the Electric Boat Company, Groton, Conn., has contracts for 42 submarines; and Bethlehem Steel at its Fore River yard and elsewhere has an enormous program of Navy vessels, totaling 76 now building or waiting their turn on the ways.

Certain other yards have been doing combination Navy and merchant work. An outstanding example is the giant Federal Shipbuilding and Dry Dock Co., at Kearny, N. J. Here you find Navy cruisers and destroyers contesting the eleven Federal shipways with Maritime Commission cargo ships and tankers.

I mentioned fresh water—and even on the Great Lakes, we're building Navy vessels. The Manitowoc Shipbuilding Company, up in Wisconsin, well over 1,000 miles from salt water, is busy at work on ten submarines which will be floated down the Mississippi. And from Detroit, Cleveland and other Great Lakes' ports, mine sweepers and subchasers will soon be on their way to help make up that two-ocean navy we need so desperately.

Throughout my tour of the shipyards I found both management and men proud of the fact that they are building the No. 1 bulwark of American Defense—united in an unswerving, all-out determination to get the job done.

Shipbuilding Teams that Work!

"The greatest asset of a shipbuilding yard is its organization—its man power—its team, trained to work together in intricate tasks," the head of one large shipyard explained to me. "And you can't build any perfect team overnight. That's one fine thing the Maritime Commission has helped do—build teams over the country."

I like to use that word "teams." And I like even better to say "American teams." Because here in this shipbuilding industry are fighting American Teams if I ever saw them. Here is an industry newborn—*yet already a giant!* Here are workers to whom ingenuity is second nature—men schooled in initiative. Here is management that has risen to the top because of sheer ability. Here is adventurous capital boldly risked for profit. Toughened by that profit system, the free men of the shipbuilding industry are now meeting the challenge of out-smarting, out-working and out-building any dictator-ridden economy on earth.

If the cry is, "Ships for Uncle Sam!"—then American industry answers: "WE WILL DELIVER."

Such an American team, backed by such a fighting spirit, means unity, means efficiency, means power—means, above all, VICTORY for our democratic way of life.

This is the fifth of a series of advertisements sponsored and paid for by Johns-Manville *and designed to tell the American people how indispensable our basic industries are for National Defense.*

— JOHNS-MANVILLE —

Pacific
MARINE
REVIEW

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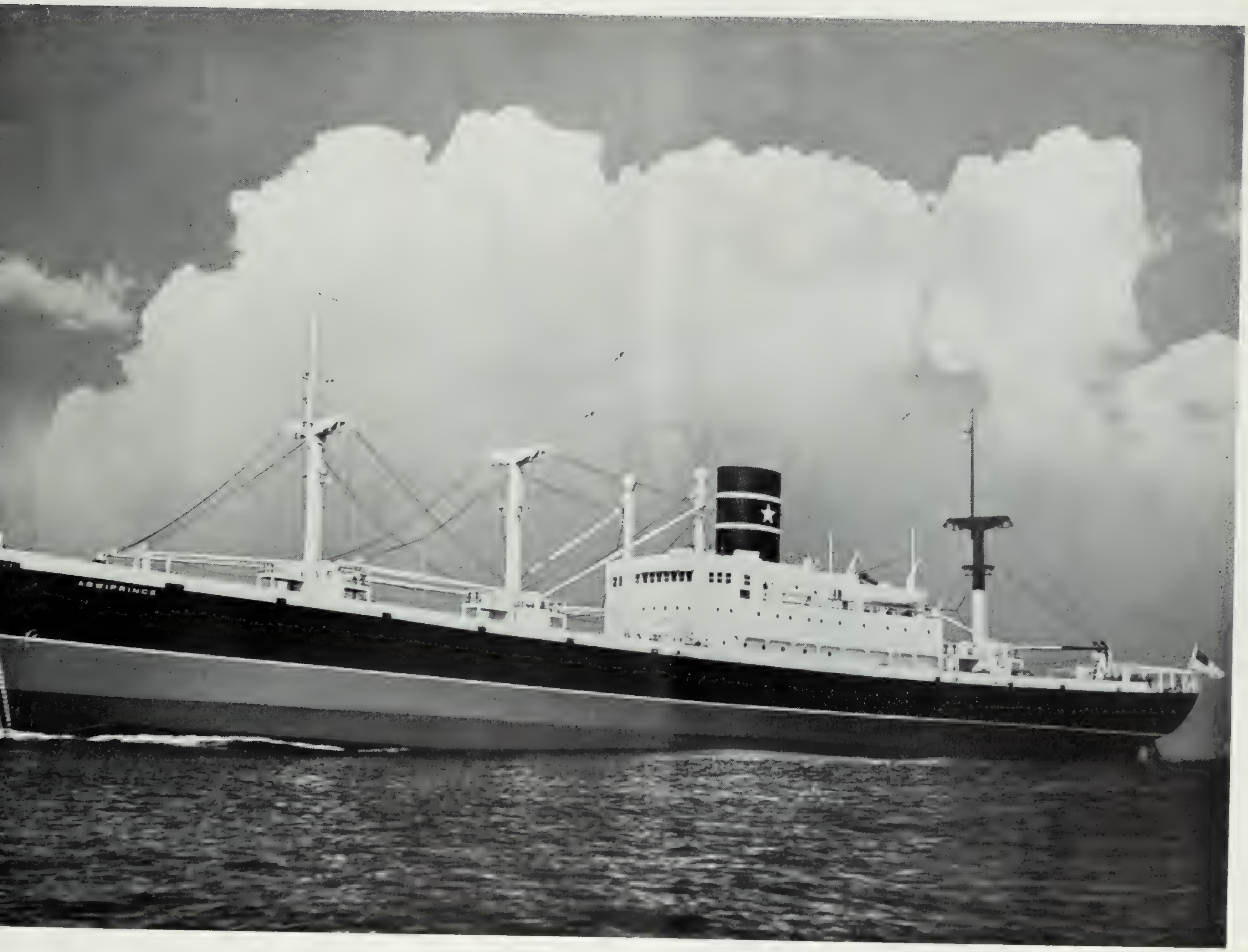

The Agwiprince

This spectacular photographic study of the latest product of Consolidated Steel Corporation, Los Angeles shipbuilders for the United States Maritime Commission, shows the C-1-B vessel heading out for her official tests

Russell J. Carroll and a distinguished visitor are interested observers of a machine operating in plate shop

Huge Prefabrication Plant at Richmond

Richmond Shipbuilding Corp. Will Manage 16 Ways and Deliver Seven or Eight Cargo Steamers Each Month

In April, 1941, when the Richmond Shipbuilding Corporation was allotted a contract to build 24 steamers of the EC-2 type, there was included a grant of five million dollars to build a complete, modern six-way shipyard for the construction of these vessels.

Later, it was decided to add three ways and additional shop facilities, and that the Maritime Commission would take over the Todd-California Shipbuilding Corporation plant upon completion of their present program of 30 British steamers.

The combined capacity of the two plants would be 16 ways, and the program will call for delivery of seven to eight cargo steamers a month. This huge capacity makes a prefabrication and assembly plant a practical necessity.

So additional allotments of funds for facilities brings the total to approximately eleven million dollars, included in which is an item of two and a half million for a new fabrication and assembly shop. This building will be around 400 feet long and 200 feet wide. It will be equipped with fabricating machinery and welding equipment of tremendous capacity. The building will be in operation before March 1, 1942, and will immediately be put in operation on superstructures. The plan contemplates that the entire superstructure will be fabricated and assembled in three units in the shop, and each unit will be placed on the hulls by cranes and welded in place as soon as each hull is ready to receive them.

Since the hulls are all identical and the superstructure units likewise identical, considerable savings in time and cost can be effected by this method of construction.

That Richmond, California, has become, almost over night, one of the nation's important shipbuilding centers is shown by the following figures:

Each of these ships has a deadweight tonnage of 10,500. The combined program of Richmond Shipbuilding Corporation and Todd-California Shipbuilding Corporation contemplates: delivery of 150,000 tons before June 1, 1942; delivery of 1,550,000 deadweight tons of shipping or 12½ per cent of the 13,000,000-ton total contemplated as a goal for the combined output of all United States yards in merchant shipbuilding.

The figures for construction of the Richmond Shipbuilding Corporation yard are very interesting and include:

2,000,000 cubic yards of hydraulic dredging;

300,000 cubic yards of rock fill;

123,000 piles driven;

Six miles of standard gage rail laid;

Parking space for 6000 automobiles.

A complete illustrated description of this yard was published in the October issue of PACIFIC MARINE REVIEW.

The men principally responsible for the remarkable progress, to date, are:

Mr. Russell J. Carroll, plant engineer representing the U. S. Maritime Commission and having the complete construction of the yard under his supervision.

Mr. Clay Bedford, general manager for the corporation.

Mr. Maurice Nichols, naval architect and marine engineer for the corporation.

The ship inspection division of the U. S. Maritime Commission will be represented by William Russell, who has been assigned on the construction of the ships as principal machinery inspector, and Charles Stewart has, likewise, been assigned as principal hull inspector. Each of these gentlemen has several assistants now available, and, when the staffs are fully manned, will have approximately 25 men between them.

The yard is now employing 4500 men, and, when the full program is underway, the normal employment will approximate 10,000.

Pacific
MARINE
REVIEW

Our Sentiments

Recently while pondering on the problem of a seasonal message to the Pacific American Merchant Marine, we received through the mail a communication from Melbourne Crisp, of San Francisco, an "old-time marine engineer," who enclosed an open letter which he proposed should be posted on every American ship's engineer's bulletin board. We so thoroughly agree with this open letter that we are here addressing it, with our compliments to the shipping and allied industries of the Pacific Coast.

Greetings, Gentlemen:

We are here! That is an established fact.

The further facts that we have shipped voluntarily, and that as free men we have signed articles setting forth the conditions under which we freely work, are each a part of the benefits that accrue to us as citizens of a democracy.

These benefits, to a great extent, are not enjoyed by men who sign articles under foreign flags. Let us, therefore, wholeheartedly show our appreciation by honestly and fully cooperating in the National Defense and with our loyal shipmates.

It is up to us, you and I, to do our part to enable this ship to proceed without delay to and from all ports, for which the proper authorities may issue sailing orders.

Let us take pride in every action toward harmony, sobriety and self-respect.

With no procrastination, there will be less work required; each man's work will be lighter; and the time we are together will pass more pleasantly.

Do not hesitate to "lend a hand." We begin as friends; let us carry on in that spirit.

We are working under the flag of a great nation—our own flag. We have a task to do—one of our own free selection. As citizens of the United States let us perform our task with credit to the American Merchant Marine and to ourselves.

The world conflict complicates our job—makes it extremely difficult.

Teamwork simplifies the job and smoothes out the difficulties.

Yours for a successful voyage in 1942.

P. M. R.

Trial Trip of the AGWIPRINCE

The S. S. Aguiprince begins its test maneuvers in Southern California "testing grounds" off Catalina Island

Steering tests are intently watched from the wheelhouse (left) by Second Officer W. M. Smith, Coordinator M. Jackson, Chief Officer Ostrander, Captain W. J. Hall of the New York and Cuba Mail, Trial Board Head J. W. Massenburg, Quartermaster Leo Kinsman, and Captain J. C. Henderson. Inserts demonstrate full circle and hard-a-port to hard-starboard tests. In the steering gear room meanwhile, Trial Board Engineers E. R. Stigen and A. B. Cecil and Assistant Machinery Inspector J. J. George look over the Lidgerwood gear, as Chief Machinery Observer G. F. Deckert checks notes of his assistant

Right: Captain A. T. Ostrander, chief officer and pilot, points out the course to Monroe Jackson of the Commission. The 30-hour voyage took the ship 110 miles out to sea

Below is W. R. Boyd, the ship's principal hull inspector, with R. L. Stakeman, chief engineer. In the background is Lloyd Earl of Consolidated Steel, and the white cap belongs to T. W. Mearns, the principal machinery inspector

Consolidated Steel Runs Tests for Maritime Commission

Early on the foggy morning of November 4, 1941, the S. S. Agwiprince steamed into Long Beach Harbor with the traditional broom hoisted to her foremast, indicating that she had made a clean sweep of her grueling sea trials. Officials expressed great satisfaction over her performance, and she particularly distinguished herself by breaking all records for C-1 vessels in her anchor test. She was built by the Consolidated Steel Corporation, in the company's Long Beach shipyard.

The Agwiprince breezed through her 4400 shp overload tests, and during her eight-hour economy run she successfully attained the standards set by the U. S. Maritime Commission. Her speed was also highly satisfactory, having exceeded 16 knots when the requirements stipulated only 14 knots. The trials included compass tests, energy meter checks, circle turns and other steering gear tests, and tests involving full speed ahead to full speed astern, and full speed astern to full speed ahead.

Among the 130 persons aboard were: R. W. Gearhart of the Consolidated Steel Corporation; H. J. Summers of the American Bureau of Shipping; Captain J. R. Balderson of the Bureau of Inspection and Navigation; and Captain W. J. Hall and the officers representing the New York and Cuba Mail S. S. Co.

The U. S. Maritime Commission's representatives included: David Currier, Chief Inspector for the Pacific Coast; W. R. Boyd, Principal Hull Inspector; and T. W. Mearns, Principal

Views of C-1 equipment, as installed by the Consolidated Steel Corp. in the Agwiprince. At right is the C-O-Two room, part of the system which protects cargo holds, engine room, lamp and paint room, and the emergency generator room.

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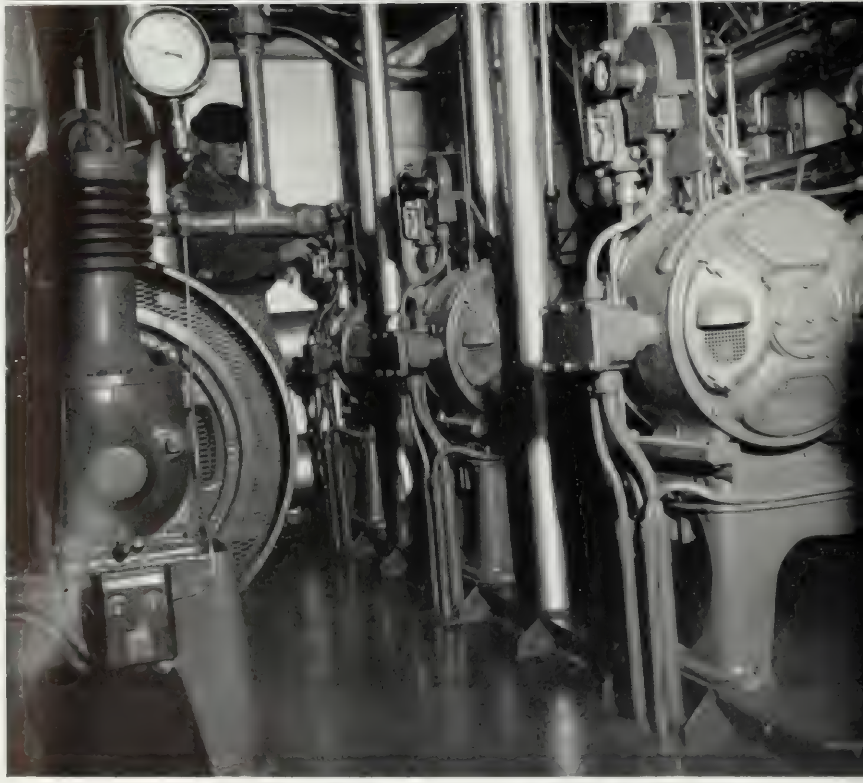


The Agwiprince has a refrigerated cargo hold, the second ship of its type on the Coast to be so equipped.

At right is part of the refrigerator room, containing a battery of six York Ice Machinery units.

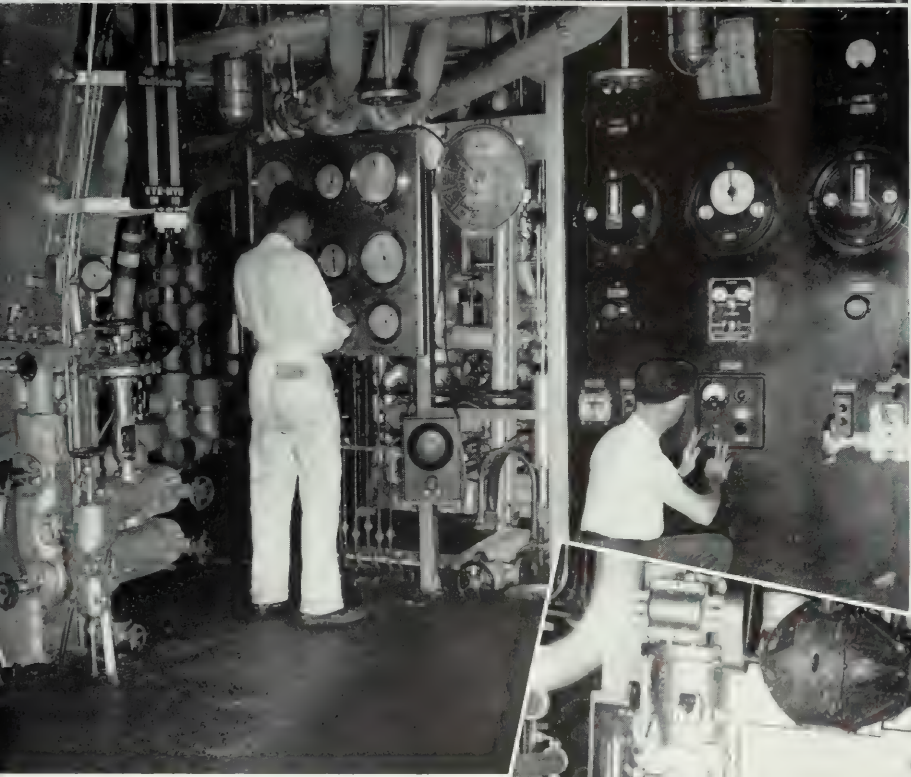
•

A number of general engine room and ship services are performed by Worthington Pumps—one of their compressors is below. The separator in the foreground is a Sharples.

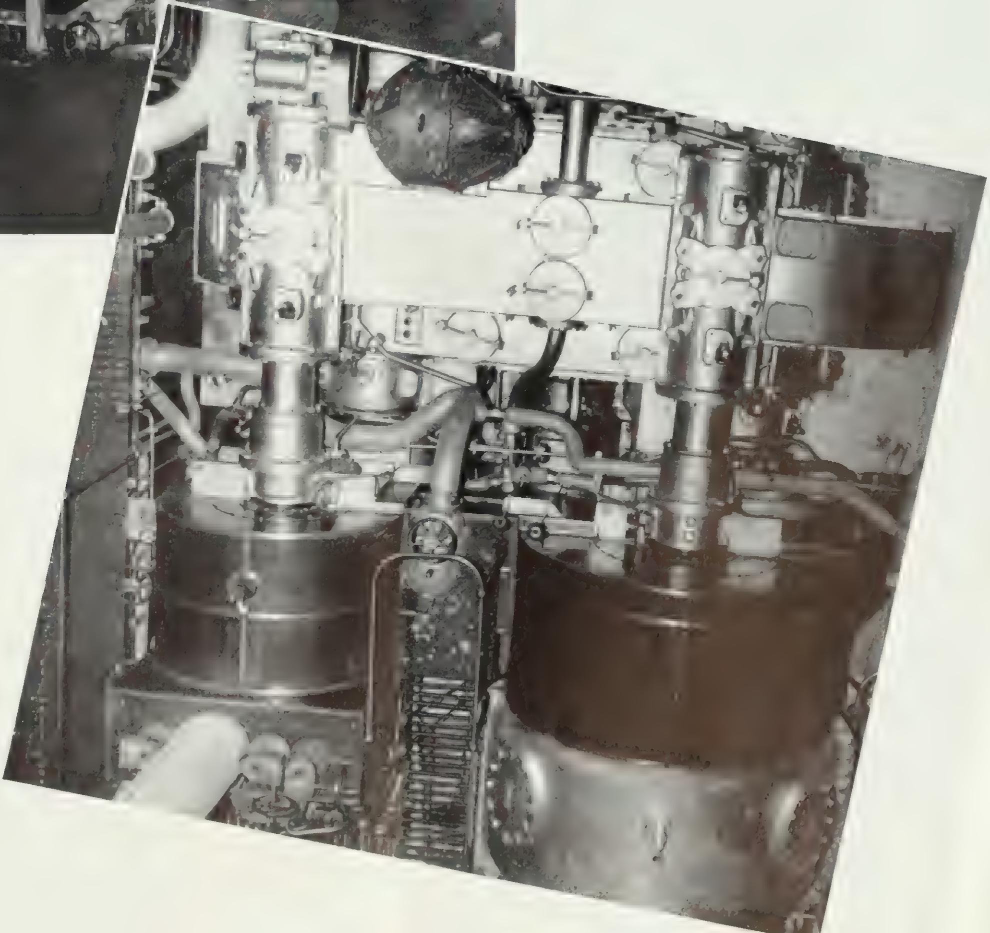
Machinery Inspector. The Commission's Pacific Coast Trial Board members were: J. W. Massenburg, Senior Member; A. B. Cecil, Marine Engineer; and A. R. Stigen, Associate Marine Engineer.

Mr. Currier accepted the ship for the Maritime Commission directly after the trials, and she was immediately put into service by her owners, the Atlantic Gulf and West Indies Lines. The Agwiprince is already in defense service: under Grace Line charter, her maiden voyage to her East Coast own-

At the turbine control board during full speed astern test are Chief Engineer R. L. Stakeman, and Marine Engineer C. Engstrom. Behind them are the Westinghouse representatives J. C. Tiefel and D. K. Steward.



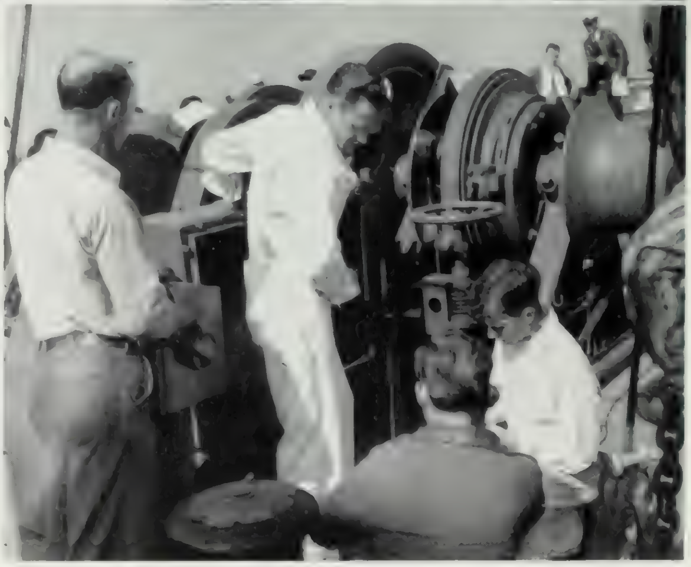
At left is part of Babcock and Wilcox boiler, and the Bailey combustion control board. The man in white is one of 15 observers who keep a continuous record of all instrument readings throughout the trial.



Looking down on the Westinghouse turbine. Of the cross-compound, double-reduction gear type, its normal rated horsepower is 4000

Feature performance of the Agwiprince trials was made by the American Hoist and Derrick Company's windlass in the Anchor Tests. With one anchor lowered to the required 35 fathoms, the other was raised at the record-breaking rate of 42 feet per minute. Then both anchors were raised simultaneously at 34 feet per minute, establishing this ship as the best C-1 to date in this test

All during the tests, Observers (right) kept a record of power consumption and motor temperature



M. Thompson, radio operator

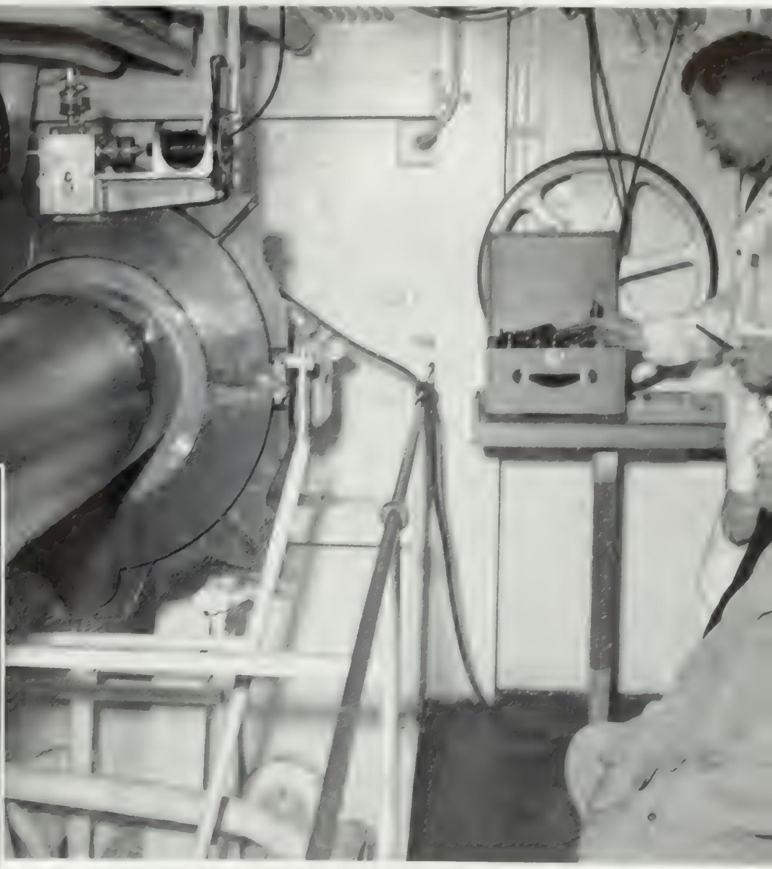
ers will be made with a cargo of Chilean nitrates.

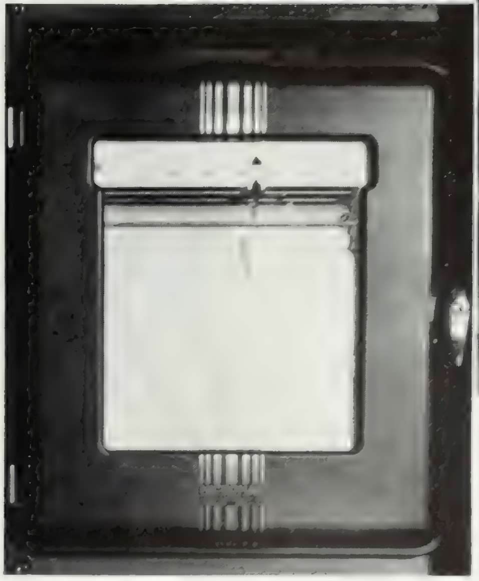
The S. S. Agwiprince is the second of thirty-four C-1 cargo vessels which the Consolidated Steel Corporation has contracted to build for the Maritime Commission, following the Agwimonte, delivered September 15. The next two ships from this yard will be the Alcoa Pennant and the Alcoa Polaris, now being completed for delivery early next year

Facing page, top left, is Captain Ostrander who supervised the anchor tests, lookin over the rail as the anchor is pulled in.

A great deal of enthusiasm was displayed over the energy meter, below, a valuable new piece of equipment. It measures electrically the torque in ninety inches along the propeller shaft, and records it on a chart in terms of shaft horsepower

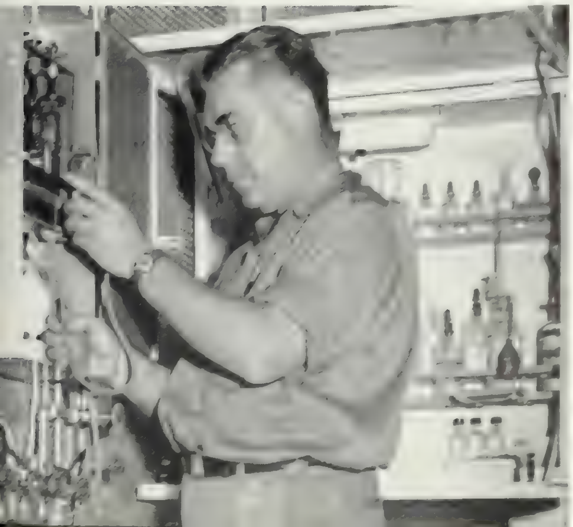
In the picture are: R. Cleeland of the Rubicon Company; G. E. LaFrance, Machinery Superintendent; and J. J. George, Assistant Machinery Inspector





Energy meter chart, above, presents the record of a build-up to 4000 shp, and then to 4400 for the 10 per cent overload test

To signal to watchers on shore in the traditional manner, the Agwiprince came to port flying the symbol of a successful voyage, a "clean sweep"



Left, in his chemical laboratory, Ray Sullivan makes tests on the boiler water for the Hall Laboratories

With the

NAVAL ARCHITECTS AND MARINE ENGINEERS

The 49th annual meeting of the Society of Naval Architects and Marine Engineers was held November 13 and 14 in the Engineering Societies Building at 29 West 39th Street, New York.

This meeting, as is usually the case, brought out ten very interesting and valuable papers. The first four were devoted to fundamental consideration of design in marine architecture; two considered engineering problems in connection with operation; and the other four might be classed as treating design, installation and operating problems connected with marine main and auxiliary power plants and power applications.

The annual formal banquet ($8.00 per plate), on Friday evening, the 14th, was crowded to capacity, with those desiring to participate in the good-fellowship and to listen to Wm. S. Knudsen, guest speaker.

The following abstracts give a comprehensive idea of the scope of the papers.

Growing Importance of Small Model Studies in Naval Architecture, by Prof. K. S. Davidson, of the Stevens Institute of Technology.

This paper outlines a series of problems which were presented to the tank staff of the Stevens Institute towing tank. These problems are all practical questions of design and not abstract research. As the author sums it up in his conclusion, these problems are:

". . . typical of the wide variety of problems with which, in increasing number, towing tanks are being confronted.

"No longer can towing tanks concentrate their efforts on problems involving only steady motion in the plane of symmetry; too many other types of problems are demanding attention. Nor is the rate at which towing tanks broaden the scope of their activities limited by any lack of practical questions; it is limited principally by their own ability to provide the necessary apparatus and to develop the necessary techniques. And it is in speeding up both of these that the small model scores heavily.

"It is obvious that apparatus and other test facilities can be provided more quickly for 5-foot models than for 20-foot models—there is no circumventing the displacement ratio (to which most of the other forces conform) of 64 between these sizes.

"It is perhaps less obvious that the development of test techniques, also, can be accelerated materially.

"The explanation appears to lie in the much closer cooperation with the designer which becomes possible. By giving the designer results when he needs them, instead of after he has been forced to make decisions without waiting, the whole mechanism of experimentation is stimulated."

Some Recent Developments in High-Pressure Boiler Feed Systems and Equipment, by E. T. Dahl and J. C. Groff.

Mr. Dahl, vice president of the Hammel-Dahl Co., is a specialist in automatic control equipment.

Mr. Groff, development engineer of the Aldrich Pump Co., is a specialist in pumps and hydraulic equipment.

The objects of this paper are threefold:

First, to review briefly the progressive development of boiler feeding practice;

Second, to discuss present-day practice in feed systems for high-pressure boiler plants of low- and medium-powered vessels; and

Third, to emphasize the importance of the most careful consideration to feed system designs for new plants.

The paper confines itself to: (1) the methods of feed control; and (2) the main feed-pumping equipment.

We shall publish a full abstract of this paper at a later date.

Seagoing Hydraulic Hopper Dredges, by Lieut. Col. H. B. Vaughan, Jr., U. S. Army Engineers.

This paper gives an interesting résumé of the historical development of dredges and a full, well-illustrated, detailed description of the design features of the new seagoing hydraulic hopper dredge which the Army Engineers propose to build for work maintaining the channels of New York and Norfolk harbors. This dredge will have the following characteristics:

Length O. A.	491 feet 3 inches
Beam molded	72 feet
Depth molded	36 feet 3 inches
Load draft	25 feet 7⅝ inches
Hopper capacity . . .	5600 cubic yards
Load displacement	16,600 tons

More of this paper later.

Test of Transient Conditions in Maneuvering a Coast Guard Harbor Cutter, by Lieut. Comdr. H. H. Curry, U. S. C. G., and J. C. Fink.

This paper sets forth test records of actual propeller torque and thrust, simultaneously recorded on a single oscillogram. So far as the authors can determine, these tests are the first of their kind in history. They were taken during the weeks of June 19 to 23, 1939, and April 1 to 5, 1940, on the Coast Guard cutter Naugatuck, which has a diesel electric power plant with two power units, each comprising an eight-cylinder, 640-shp diesel engine driving a 400-kw dc generator, and supplying power to a single 800-shp, 500-volt, 250-rpm motor driving a single-screw propeller. The motor will deliver 1000 shp at 235 rpm on a special electrical arrangement used when in ice-breaking service.

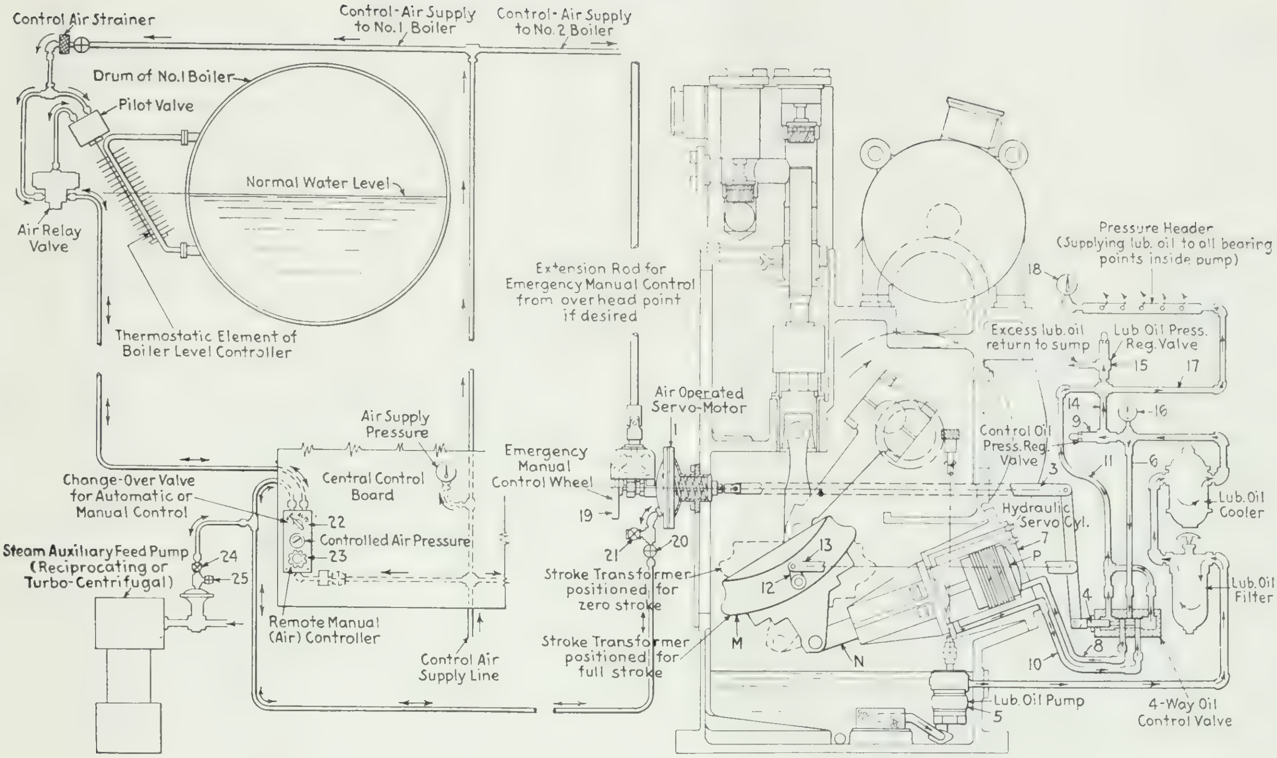

Control Air Strainer
Control-Air Supply to No.1 Boiler
Control-Air Supply to No.2 Boiler
Drum of No.1 Boiler
Pilot Valve
Normal Water Level
Air Relay Valve
Thermostatic Element of Boiler Level Controller
Extension Rod for Emergency Manual Control from overhead point if desired
Air Operated Servo-Motor
1
Air Supply Pressure
Emergency Manual Control Wheel
Change-Over Valve for Automatic or Manual Control
Central Control Board
22
Controlled Air Pressure
23
24
25
19
21
20
Steam Auxiliary Feed Pump (Reciprocating or Turbo-Centrifugal)
Remote Manual (Air) Controller
Control Air Supply Line
Stroke Transformer positioned for zero stroke
Stroke Transformer positioned for full stroke
M
N
12
13
Pressure Header (Supplying lub. oil to all bearing points inside pump)
18
Excess lub. oil return to sump
Lub Oil Press. Reg. Valve
15
17
14
9
16
Control Oil Press. Reg. Valve
3
11
6
Lub. Oil Cooler
Hydraulic Servo Cyl.
7
P
4
Lub. Oil Filter
8
10
Lub. Oil Pump
5
4-Way Oil Control Valve

Diagram of the feed control and pump stroke control systems for a unit type feed system

The results showing step by step just what happens to torque and thrust during reversal of motor and of ship are exceedingly interesting and will bear very careful study. The method used should now be applied on a larger seagoing vessel.

We will be coming back later to this paper.

Alternating Current in the U. S. Navy, by Lieut. Comdr. H. G. Rickover, U. S. N.

A fine coverage of its subject, this paper describes the alternating current electric propulsion plants, auxiliary power plants, and the service electric applications now in use in the U. S. Navy. Cost, weight and space comparisons between alternating and direct current equipment are set forth in considerable detail.

Wiring fixtures and fittings, protective devices and control equipment are adequately discussed.

The author concludes:

The advantages of alternating current for the large propulsion systems now in operation were obvious from the beginning. Direct-current generators and motors are limited to relatively low voltages, and for large power installations equipment suitable for handling the abnormal current was neither available nor practicable for shipboard installation. The alternating-current system was therefore adopted in all instances for this application.

The situation with regard to ship's service power presented a different aspect. Direct-current systems were in operation on existing vessels and the adoption of alternating current for new vessels involved a number of problems which have been treated in some detail. The change-over was made in the interests of the advantages which have been previously outlined and it is believed that the operating record of these alternating-current systems for the past eight years, and the present general approval by naval personnel offer sufficient justification for such a major change.

In conclusion, it is desired to acknowledge the valuable assistance contributed by the electrical industry in adapting alternating - current equipment to naval service. The representatives of the industry have willingly given their time and the benefit of their engineering experience toward the solution of the various problems, and the success of these alternating-current systems is largely due to this generous cooperation.

A 1200-PSI Reheat Marine Installation, by Benjamin Fox and Richard H. Tingley.

This paper discusses the fundamental considerations leading to the choice of a reheat cycle for the 1200-psi installation on the S. S. Examiner, one of eight identical hulls building at the Bethlehem shipyards for the American Export Line. The other seven ships have conventional Maritime Commission 425-psi power plants. The authors give a very complete description of the 1200-psi plant, and close with this summary:

Comparison of the 1200-pound reheat design with the 425-pound design for these sister ships leads to the following tentative conclusions:

Fuel Economy. The fuel per shaft horsepower will be about 0.513. This is a reduction of 12.8 per cent compared with the 425-pound design. In much larger plants with the same steam pressures and temperatures, there should be a gain due to the necessity for avoiding large motor-driven reciprocating feed pumps.

Weight. The increase in dry weight of machinery is 9 per cent. In larger installations the weight of the high-pressure design will probably approach more closely to that of the low-pressure design, because the large reductions in quantities of fuel, steam and water will permit reductions in sizes of units and piping beyond those that were practicable in the smaller installation.

Space. A workable arrangement has been provided in the same space as was allowed for the 425-pound design. The reheater piping has caused some congestion and some decrease of accessibility, but apparently not to a prohibitive degree. On larger installations, it is likely that the high-pressure design will require relatively less space. However, it will be essential in all cases that the boilers be located close to the propelling unit they serve; otherwise the reheater piping may be prohibitive.

Cost. The relative costs of the high-pressure and the low-pressure machinery on this class of vessels is not a true criterion, as the high-pressure was built for one ship and the low-pressure for seven, and the high-pressure included an unusual amount of development work. Inasmuch as types of materials and workmanship on the two designs are not radically different, it appears reasonable to assume that ultimately the inherent difference in cost would be about the same as the difference in weight. This indicates possibly 10 per cent increase for a vessel of the shaft horsepower discussed, tapering to no difference for a vessel of much larger power.

Operation, Maintenance and Reliability. The probabilities are a little more care, a little more servicing, a little more to get out of order. However, pending actual experience, judgment should be suspended.

Precision in N. A. Calculations, by Edw. V. Lewis, technical asst. to George C. Sharp, N. A.

The "purpose of this paper is to develop some general principles of precision in naval architectural calculations and to illustrate the application of these principles to some of the common problems."

Analysis of the various factors shows that the precision of the final result depends on the determination of the combined effects of accuracy of data, accuracy of method, and accuracy of numerical calculation. The author had made some experimental attempts to produce average values for inaccuracy in these three factors.

In the application of calculations, additional factors are involved in overall precision. The author makes a displacement calculation applying all of the probable errors as figured from his own analysis and finds on a ship with a displacement of 14,970 tons a probable overall error of + or — .51 or + or — 76 tons. So he concludes that the naval architect, instead of proposing a ship of exactly 14,970 tons, should promise that displacement tonnage plus or minus 80 tons.

Similarly, he finds: on calculations for "Center of Buoyancy" probable errors of + or — 0.047% for the vertical position, and of + or — 0.39% for the longitudinal position; on light weight of ship calculations a probable error of + or — 2.6%; in K G calculations a probable error of + or — 1.88%; and in G M calculations a probable error of + or — 1.1%.

Author's remarks on speed and power indicate factors that are hard to analyze. The usually important source of inaccuracy lies in estimating the margin of power to be added. An excess margin may show as poor designing as an insufficient margin. Margin should take practical operating conditions into account. The trade route, time between drydockings, port delays, speed length ratios, differences in water temperatures en route as it affects skin resistance and also condenser performance.

Design Curves for Cross-Stiffened Plating Under Uniform Bending Load, by Lieut. Comdr. H. A. Schade, U. S. Navy.

Author is a graduate of Annapolis (1923); post graduate at M. I. T. (1928); served at Mare Island, California, in Construction Corps (1928-1931); Bureau of Construction and Repair, Washington, D. C. (1931-1935); special studies in ship structural problems at Technische Hochschule, Berlin (1935-1937); and is now in the office of Supervisor of Shipbuilding, Newport News.

This paper is an expansion of his paper presented last year, in which he applied the "Orthotropic Plate" theory to a special case. "The theory has since been expanded to a more general and a more accurate form, and the purpose of this paper is to give a simple and practical general design method based on it."

This method is applicable to the following types of stiffening:

Type A. Cross-stiffening. The middle stiffener of either or both sets may be stiffer than the other stiffeners of the set.

Type B. One set of repeating stiffeners, and a single central stiffener in the other direction. The middle stiffener of the repeating set may be stiffer than the others, as in the foregoing case.

Type C. One set of repeating stiffeners only.

Type D. Plating without any stiffeners.

Of the great variety of possible conditions of fixity and support which might exist at plate boundaries, four typical cases are selected for consideration. These are:

Case 1. All four edges rigidly supported but not fixed;

Case 2. Both short edges fixed, both long edges supported;

Case 3. Both long edges fixed, both short edges supported; and

Case 4. All four edges fixed.

Mathematical analysis of maximum deflection and stress gives a series of basic design curves covering these types and cases.

Investigation of the Behavior of a Riveted Joint Within a Plated Structure, by Lieut. Amelio M. D'Arcangelo, Argentine Navy, and Lieut. James A. Brown, U. S. Navy.

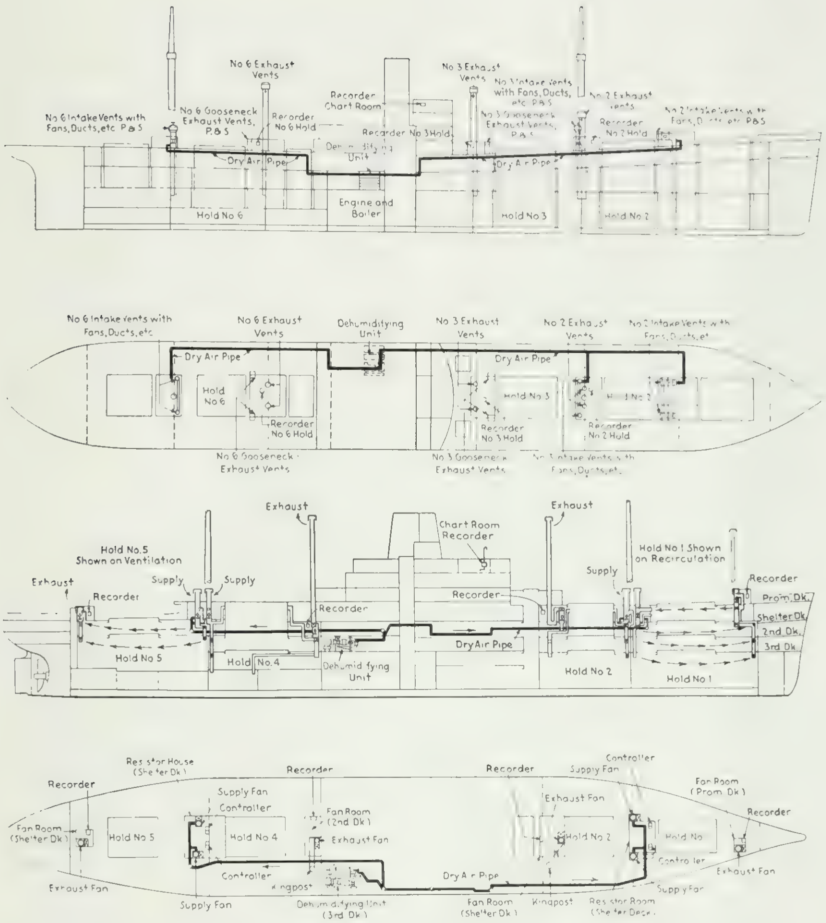
This paper describes the testing of a riveted joint modeled after the typical deck plating joint of U. S. Navy destroyers. The tests were made with special reference to the nature and effect of ship on riveted structures.

The authors' conclusions are:

1. Slip does occur in riveted structures. The slip is of the same magnitude as strain and is a function of the load at loads below the yield of strength of the joint.

2. When slip occurs, the load on the joined plates is unloaded onto the adjoining members, and this unloading tends to be concentrated in the material nearest the joint.

3. Unsymmetrical riveted joints are unreliable and cause unsymmetrical load distributions.



Upper inboard profile and plan show dehumidification system on Exporter class of steamer. Lower inboard profile and plan show the system as applied to the African Comet type

4. The outer row of rivets in a riveted joint takes the greater part of the load. Omitting rivets in the outer row causes very great concentration of stress in the main plate.

5. Great care should be exercised in the design of riveted joints in mechanical structures of all types. In riveted structures, adjoining plates should not be of greatly different thickness. If the general requirement for light weight and economy require structures with adjoining plates of radically different thickness, the butts in the thick plates should be welded to prevent the slip and consequent overloading of the thinner plates.

6. The authors feel that the omission of alternate rivets in the outer rows of joints does not give an increase in strength. This fact has been borne out by many independent tests on riveted joints and no experimental evidence to the contrary could be located in the engineering literature.

Care of Cargo at Sea II, by Oliver D. Colvin and Werner H. E. Hahne.

This paper styles itself an interim report, describing the practical application of the principles set forth in the authors' paper, read before the annual meeting of 1938, and published in full in PACIFIC MARINE REVIEW. "It analyzes the commercial operation of dehumidification systems on cargo ships under ordinary service and under maritime conditions."

With the successful performance of the new system on the first round trip, the Maritime Commission and others became interested in this system, and, at the time of writing this paper, some 200 vessels built or building had incorporated Cargocaire systems in their design.

The authors summarize results as follows:

(a) The theories expounded in Section I of this paper, presented before this Society in 1938, have been proved correct;

(b) The magnitude of the capacity required to cope with the problem was known to be great but was found to be even greater than anticipated;

(c) Equipment that has been installed has demonstrated that moisture in loaded cargo holds can be entirely controlled; consequently, moisture damage and depreciation of basic commodities and finished products, such as military stores, can be prevented; and

(d) Dehumidification can be successfully applied to prevent corrosion and deterioration in decommissioned naval vessels and in closed compartments of commissioned vessels.

◆

Induction Heating of Machine Parts

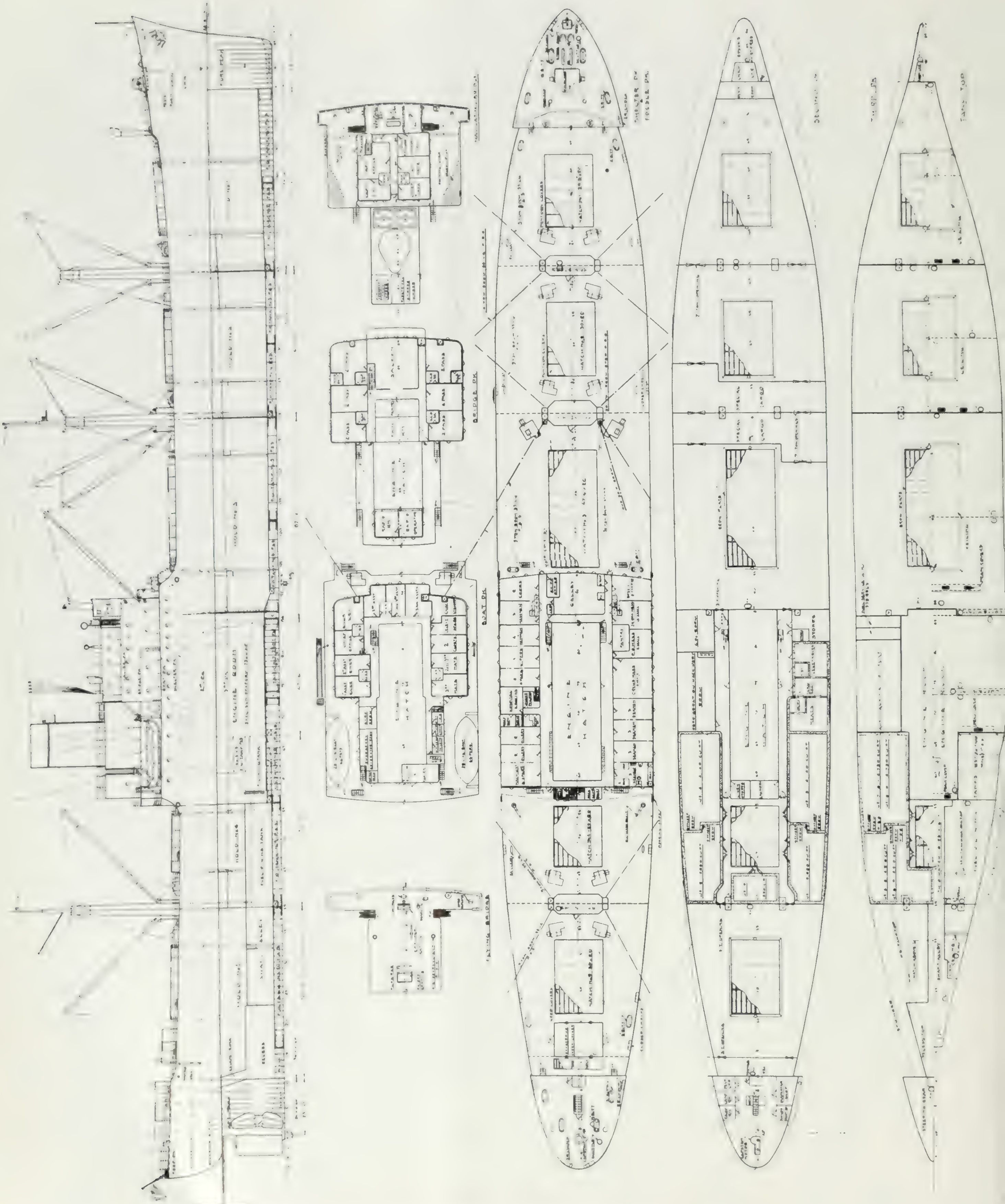
The demand for greater speed in forming and treating steel machine parts has more than doubled the production of high frequency, inductive heating generators, according to J. B. Walker, manager of the Westinghouse Transportation and Generator Sales Division.

With inductive heating, it is possible to harden steel surfaces to any desired depth and width. A shaft can be given hardness at points where it must resist wear without destroying the toughness of the whole piece. This is important because most methods of heat hardening make steel wear resistant but brittle.

In addition to being the best method yet devised to harden the parts of machines that must withstand wear, such as the bearing surfaces of an automobile crankshaft or cylinder wall, induction heating is also used for softening steel so that it may be rolled or pounded into shape.

Now being built big enough to merit hydrogen-cooling, one of the largest machines yet made was recently delivered to the Caterpillar Tractor Company. This 9600-cycle unit consists of a 500-kw generator and an 800-hp, 3600-rpm driving motor mounted within a single housing.

The steel to be heated is placed within a coil to which the output of the high frequency generator is connected. The rapidly varying magnetic field induces eddy currents in the metal, which causes the heating.



Inboard profile and general arrangement of deck and hold plans of Island Mail.

M. S. Island Mail

At Chester, Pennsylvania, in the great shipyard of the Sun Shipbuilding and Dry Dock Co., a program of fast cargo motorships of the M. C. C-2 SU type is under construction. Several of the first of these vessels were assigned to the transpacific service of the American Mail Line. On delivery of number one, the China Mail, to the Maritime Commission, she was transferred to British operation under Lease-Lend provisions and her name changed to Empire Peregrine.

Number two of this program was launched June 21, christened Island Mail, and is due to be delivered before this article appears in print. If she is not diverted, she should be on her maiden voyage on the Pacific before the new year.

These vessels are of Sun design, based on the C-2 shelterdeck cargo type of the U. S. Maritime Commission.

As will be noted from the inboard profile, reproduced herewith, they present a graceful appearance, having a flush deck and a fine sheer, with slightly bulbous raked bow, and cruiser stern.

There are two complete decks (shelter and second), and a third deck, fitted from the bow to the forward side of the engine room forward bulkhead, and from the after side of the engine room after bulkhead the after end of Hold No. 4, Seven water-tight bulkheads divide the hull into eight water-tight compartments, viz.: the fore-peak; hold No. 1; hold No. 2; hold No. 3; the engine room space; hold No. 4; hold No. 5, and the after peak. The collision bulkheads forward and aft are carried water-tight to the shelter deck. The five intermediate water-tight bulkheads are carried up to the second deck, which is the freeboard deck; between the shelter and second decks these bulkheads are fitted with tonnage openings.

Construction and equipment of the hull and machinery comply: with the rules of the American Bureau of Shipping for the highest class in this type of cargo vessel; with the regulations of the Bureau of Marine Inspection and Navigation of the Department of Commerce; and with the prescriptions of Senate Report No. 184 of the 75th Congress, first session.

Principal Characteristics

Length O. A.	**474′1″**
Length B. P.	**450′0″**
Beam molded	**63′0″**
Depth molded, S. D.	**40′6″**
Depth molded, 2d D.	**31′6″**
Depth molded, 3d D.	**21′6″**
Summer draft molded	**26′6″**
Displacement	**15,000 tons**
Deadw't cap. tot.	**9,600 tons**
Fuel oil	**2,200 tons**
Fresh water	**175 tons**
Culinary water	**65 tons**
Crew, etc.	**30 tons**
Cargo	**7,130 tons**
Cargo cap.	**530,110 cu. ft.**
Fuel cap.	**14,600 bbls.**
Normal shp	**7500**
Sea speed loaded	**16 knots**

Deck machinery is all electrically driven and is ample to take care of all cargo handling and maneuvering demands. Winches, windlass, and steering gear are all by American Engineering Co., driven by Westinghouse motors. Fourteen cargo winches and fourteen 5-ton and one 30-ton cargo booms serve the five hatches. Wire rope is by Roebling or by Jones and Laughlin. Baldt anchors and Baldt Di-Lok anchor chain are used.

On the bridge and in the pilot house is the usual full complement of modern navigation instruments, including: wireless equipment by the Radiomarine Corporation of America; gyro compass, gyro pilot, gyro course recorder, and rudder indicator by the Sperry Gyroscope Co.; Fathometer echo depth sounding mechanism by the Submarine Signal Corporation; engine room telegraph by Bendix Aviation Corporation; ship telephone system by the Control Instrument Company; and the Lux-Rich smoke detection cabinet by Walter Kidde Company.

Arrangement of all compartments in the hull is shown clearly in the general arrangement drawings. Noteworthy in this connection are the long hatch way in No. 3 hold and the compact arrangement of refrigerated cargo rooms, refrigerated ship's stores and refrigerating machinery in No. 4 hold and 'tween decks. The eight cargo refrigerator rooms have a combined capacity of 30,600 cubic feet. A Carrier refrigerating installation takes care of the perishable cargo and ship's stores needs.

All cargo and all accommodation spaces are thoroughly ventilated and partially air conditioned.

Propulsion Machinery

Island Mail is propelled by a single screw, driven by a direct connected diesel engine. This engine is of the opposed piston Sun-Doxford type. It has five cylinders in line with a scavenge air pump cylinder between power cylinders No. 3 and No. 4. Each power cylinder has a bore of 32″ and a combined stroke of 95 inches.

The frame, columns, and cylinder entablature are all fabricated of steel plates by welding.

This engine works on the solid injection system in a two-stroke cycle. The attached crank-driven pump provides 28,500 cfm of scavenging air at 3 psi, when the engine is running at normal speed.

The fuel oil system serving this engine draws oil from the double bottom and deep tanks to two fuel oil settling tanks located on the port auxiliary machinery flat. From these tanks it is fed through Sharples centrifugals to two clean service tanks on the starboard auxiliary machinery flat. Booster pumps take the oil from these tanks and discharge it to the main engine

(Page 43, please)

News FROM THE PACIFIC NORTHWEST

by Daniel L. Pratt

Huge Army Depot Under Way in Seattle

The huge Army depot, being built at Seattle on the old Ford plant on East Marginal Way, is rapidly taking shape. In connection with this general depot is the huge warehouse 1128 feet long, 308 feet wide, with a total of 347,424 feet of floor space. It will be, it is reported, the largest single-story building between four walls and under a single roof west of the Mississippi River, and construction is already 11 days ahead of schedule, although it was started 14 days behind.

Extremely novel is the treatment that was given the concrete piles which support the huge structure. Wooden piles were driven first to a point below the high level of the river's water table and then the concrete piles placed on top of them. These were heat-treated, an idea conceived by E. Donald Miller, engineer in charge of the project under Capt. H. L. Morian. Finding that the Seattle climate was not adapted to the rapid curing of piles, 7140 of them, they were subjected to steam heating as soon as they were poured. They were given 14 hours of steam at 100 degrees, and then 24 hours at 70 degrees. It was found that each pile would stand 60 tons of live pressure. It worked so well, they applied the same method to slab concrete, using lateral steam pipes beneath them for this purpose. Steam is not needed unless the temperature drops below 50 degrees.

Oregon Shipbuilding Launchings

After being a little slower than other ports on the Pacific Coast getting under way, Portland has now stepped into the limelight and the Oregon Shipbuilding Corp., especially, is making records in Northwest shipbuilding. Although this was one of the newer yards to be started on the Coast after the Defense Program began, on October 26 the third freighter in 29 days was launched, which is claimed to be a record for the country. This was the 8500-ton "Liberty" freighter William Clark, built under the U. S. Maritime Commission program. At practically the same time the fourteenth keel was laid in the company's big plant.

Henry J. Kaiser, head of the corporation, promised that the first ship would be ready for sea soon, after Capt. Vickery, of the Maritime Commission, had commended the workmen on their speed. "Captain Vickery," said Mr. Kaiser, "expects this yard and the other two we are operating, to deliver one ship a day, 365 ships a year. We can do it if he furnishes us with steel and materials." The Oregon yard early in November received its fifth allocation, $3,528,000, since the yard was started, for a further expansion program.

Oregon labor unions working on defense contracts have been the first in the Thirteenth Naval District to agree to the suggestion of the same wage on conversion work as on new work, with Seattle and Tacoma still holding back at this writing. As a consequence the Government has not only ordered more overtime on conversion jobs, but has been inclined to be more liberal on orders for new work. Allocations for plant cost have also been liberal, those for the Oregon Shipbuilding Corp. having been as follows: First, $4,700,000 for eight ship ways; second and third, $2,240,000 and $1,950,000 for ship ways; fourth, $442,000 for cafeterias and office additions; and fifth, $3,528,000 as mentioned above.

American Mail Loses Vessel to British

Just as she was ready to be delivered to the American Mail Line of Seattle, the new Maritime Commission ship China Mail was requisitioned and turned over to the British under the Lend-Lease Act. The new 9600-ton, 16-knot ship, renamed the Peregrine, was ready on November 1 for her first trip into the war zone. Officials of the American Mail Co. were looking forward, however, subject to emergency conditions, to delivery from the Sun Shipbuilding yards at Chester, Pa., of two of her sister ships, the Island Mail and Japan Mail, the first about November 20 and the other soon afterward, according to A. R. Lintner, vice president of the steamship company, who returned from Washington, D. C., about November 1. A complete description with drawings of these vessels will be found on page 36 of this issue.

Panoramic view of huge U. S. Army depot being erected in Seattle

Anti-submarine net tender Buckeye in Puget Sound Navy Day Parade.

Seymour Narrows To Be Improved

One of the greatest menaces to navigation of the inland passage to Alaska, Ripple Rock in Seymour Narrows, is to be lessened by removing the more dangerous pinnacles from it, according to an announcement by the Canadian Government. Removal of this rock, which has caused numerous shipwrecks during the last half century, has been discussed for years. Now work will be started on the project as a defense measure, as ships carrying troops and large cargoes of supplies used in the preparedness program in Alaska pass through Seymour Narrows, where the swift tides and the obstruction of Ripple Rock increase the danger to navigation.

Navy Day Parade

Seattle and Tacoma had a joint celebration of Navy Day in late October, so far as the Navy Parade was concerned, for the parade assembled at Pier 41, Seattle at 8 a.m., proceeded as far south as Tacoma to circle the waterfront there, then returned to Seattle they paraded Elliot Bay. It wasn't much of a parade so far as spectacular features go, and the weather was gray and foggy, limiting the visibility. Most interesting features so far as the spectators were concerned, were the two odd-looking anti-submarine net tenders Butternut and Buckeye. Beamy and squat, their distinguishing points were two great steel horns projecting forward like a pair of stubby bowsprits on a sailing vessel. The complete armada was about as strange an assembly of boats as often get together in a naval fleet. With the exception of four sleek destroyers from Division No. 28, the Gilmer, Kane, Brooks and Fox, under command of Commander Jerome Allen, most of the vessels were converted, locally built boats largely for coastal patrol and local harbor purposes. These destroyers led the parade, and next in line came World War Eagle No. 9, one of the original Ford-built fleet of "Pickle Boats," and used now for training ships. Then followed Amber, once the proud Infanta, private yacht of John Barrymore, now a Navy coastal yacht; then came the coastal minesweepers Frigate Bird, Crow and Pintail, former purse-seiners converted. There was also a swarm of "Yp's," small coastal patrol vessels commanded by young ensigns and some miscellaneous craft.

Record on Upper Columbia Tonnage

Because of increased navigability made possible by the Bonneville locks, the upstream movement of freight and the downstream movement of wheat and other commodities are making new records for tonnage on the upper Columbia River. During the first ten months of this year the U. S. Engineers report that 759,299 tons of freight passed through Bonneville locks, as compared to only 706,000 for the entire twelve months of 1940. Celilo Canal traffic for 10 months reached 339,000 tons, a gain of 15,000 tons for all of 1940.

Shark Livers New Gray Gold

Once along the Seattle waterfront, the fish dealers used to save the fish and throw the livers away, but now with certain species they are doing the opposite. The lowly dogfish, heretofore hated by all fishermen, has taken on a high commercial value, and the soup-fin shark has become a really rich prize. And all because after having gotten along pretty well since the Cave Men Days, the human race has suddenly discovered it must have vitamins; and the livers of these fish are full of vitamins of the sort for which the market is most eagerly seeking.

Hundreds of examples could be cited of rich cargoes brought in in small boats during October and November. Just as one instance, three schooners arrived in Seattle in one day from the offshore banks, bringing 6040 lbs. of dogfish livers and 1020 lbs. of soup-fin shark livers. The former sold from 44 to 47 cents a lb., the latter at from $7.50 to $7.75 a lb. The schooner Signe, coming in with cod, also brought 120 lbs. of shark livers, 10,000 lbs. of dogfish livers. The soup-fins sold for $8, the dogfish for 50 cents, and the buyers, anxious to secure the livers, also bought the cod at 51 cents a lb., a new high for codfish.

Important Charter Deals

Three of the most important charter deals consummated in Seattle for several months involve the Diamond Cement of the Pacific Coast Cement Co., and the cannery ships Otsego and General W. C. Gorgas, well-known Libby, McNeil & Libby ships, to the Army Quartermaster Department. The announcement by Lieut.-Col. Thomas J. Weed, Q. M. C., assistant superintendent of the Transport Service in charge of operations at Seattle, also revealed that his department had taken over a large portion of Pier B, including the outer end of the dock, for the transshipment of freight and cargo already assembled there.

Marine Shorts

McGinitie & McDonald, Seattle ship surveyors, have taken bids for converting the former U. S. Navy submarine tender Savannah into a cargo ship. **Todd-Seattle Drydocks, Associated and Lake Washington Shipyards** were the bidders. She was formerly the German steamship Saxonia and was interned in Eagle Harbor, Puget Sound, and seized when America entered the World War in 1917. She was purchased from the Government by the Dulien Steel Products Co., Seattle, and later sold to Arnold Bernstein & Associates of New York. She will be rebuilt and converted from a coal into an oil burner.

Representatives of chambers of commerce and other organizations met in Portland in October to form the Western States World Trade Council. **L. W. Hartman** of Portland was elected president. Purpose of the organization, which was a follow-up of the Pacific Coast Foreign Trade Conference held at San Francisco in mid-September, is to coordinate the efforts of all of the eleven Western States in promoting and advancing foreign trade interests of the Pacific Coast in every way and to realistically approach the problems of war and post-war eras.

* * *

The 133-foot schooner yacht **Black Douglas,** recently purchased by the Government in Savannah, is now on her way to the Pacific Coast, where she has been assigned to a commission of carrying a group of scientists who will follow the fur seal herds for several years. **Dr. Victor B. Scheffer,** biologist of the Fish and Wild Life Service in Seattle, will be at the head of the commission. Chief purpose of the cruise, which will start in Southern California waters, will be to gather new information on the kinds and number of fish and shellfish eaten by the seal herds over their entire marine range.

* * *

At the Twentieth Annual meeting of the Northwest Rivers and Harbors Congress, held at Everett November 15, a resolution was passed urging the U. S. Engineers to dredge a channel 15 feet deep and 150 yards wide from Young's Bay to the Astoria Marine Construction Company's shipbuilding yard on the Lewis & Clark River near Astoria. Resolutions were also passed urging the continued consideration by the War and Navy Departments of the selection and development of suitable airports in connection with various Northwest harbors.

Frank H. Gowdy, Longview, was elected president; Luke L. Goodrich, Longview, first vice president; and their home town was selected as the meeting place for next year. Alex D. Stewart, Seattle, was re-elected secretary. Trustees named were: John P. Doyle, Portland; Maurice Anderson, Newport; N. J. Whitcomb, Willapa Harbor; A. J. Bogan, Port Townsend; F. W. Epperson, Port Angeles; H. P. Chapman, Seattle; and Hans Mumm, Jr., Everett.

Another 10,000-ton steel cargo ship for Britain, the Fort Churchill, was launched at the **Burrard Drydock** plant at Vancouver November 20. There was no launching ceremony, not even the traditional christening with champagne.

* * *

Seattle had a strange visitor arrive in port just recently, the Russian icebreaker **Krassin,** which came there for extensive repairs, joining three other Russian vessels repairing at Todds, the **Bellomorcanal, Volkhovstroi** and **Felix Dzerjinsky.** When the work is completed, all will sail for "unannounced destinations." Odd feature about the Krassin is the sloping bow that enables her to rest her heavy weight on the ice, the cruiser stern and broad beam of 71 feet 6 inches. She was built in Newcastle, England, as the **Sviatogor,** in 1917, is of 4092 gross and 2342 net tons register, with a length of 318 feet.

* * *

C. J. Furrer, Chief Yeoman, U. S. Coast Guard, acting recruiting officer in the Seattle District, states that a quota of about 20 new men is needed each week to be sent to the maritime training school at Port Hueneme, California, for a course in seamanship and other phases of maritime service. Boys between 18 and 24 years of age are preferred.

* * *

Another new shipyard for Portland seems possible, as this is being written. The County Commissioners announced that they had leased a 20-acre tract near the St. Johns Bridge to a trio of Portland business men. These men, **A. H. York, Clayton Sharp** and **R. C. Shattuck,** are already reported to hold leases for thirty acres of adjoining property. They are not ready at this time to discuss their plans beyond the fact that they had submitted bids for steel ships.

* * *

The schooner **Commodore,** veteran of many years in the Puget Sound-Hawaiian lumber trade, and for a time converted into a barge, will soon again be sailing the seas. She is at the **Winslow Shipbuilding** yard at present getting the finishing touches to make a windjammer lumber carrier out of her. These will include installation of a bowsprit, rigging of masts, bending of new sails, painting and drydocking. The vessel was due to start loading the middle of November, starting at Port Angeles with a cargo of lumber for South Africa. She was recently purchased by **Alan Dohrmann** of San Francisco, head of the **Honolulu-California-Pacific Co.**

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Marine Short Shorts

Col. W. C. Bickford of the Port of Seattle recently returned from Washington, D. C., and reported that the port's proposal to construct two big piers at the foot of Connecticut Street has the approval of the RFC, and it is hoped the loan will be approved and construction started in the near future. . . . Construction of new highway facilities to serve Harbor Island, where the city's largest shipyards are located, will begin at once, according to **Geo. R. Stuntz,** state work projects administrator. This will include widening of present roadways to **Seattle-Tacoma Shipbuilding** plant No. 2, **Associated Shipbuilding, Seattle-Todd Drydocks,** etc. A new $110,000 Harbor Island fire station project will also be rushed to completion. . . . On account of increased traffic in Rich Passage between Bainbridge Island and Point Glover, due to increased defense activities at the Puget Sound Navy Yard, inbound vessels have been warned to concede the left side of this tortuous and swift tidal channel to vessels outbound. . . . **Colby Steel & Engineering Co.,** Seattle, submitted the only bids received by the Navy Department for a recent order of a certain type of drydock cranes, according to word received from Washington. Their bids were only on three items, Item 4, $474,410, Item 5, $277,160, and Item 6, $262,500. Cranes are to go to Terminal Island, Puerto Rica, etc. . . . Option on Astoria Port Terminal property has been secured by the **Columbia Drydock & Shipbuilding Co.,** a newly organized concern that plans to build concrete barges. . . . The **Star of Oregon,** built by the **Oregon Shipbuilding Corp.,** was to have been delivered to the **States Steamship Co.** of Portland November 18 and the **Merriwether Lewis** on November 25 to the **American Mail Line, Ltd.** . . . Coast Guard in Washington has authorized the Seattle District to acquire a few more vessels for harbor duty. Preference is for boats at least

(Page 55, please)

News FROM THE PACIFIC SOUTHWEST

by K. M. Walker

Traders Catalog

A unique catalog is in process of printing that is especially designed to give Latin American distributors, importers and merchants a comprehensive knowledge of the products of Southern California manufacturers. This book, prepared by the L. A. Chamber of Commerce, will be distributed to 5000 selected buyers in Spanish- and Portuguese-speaking countries.

Los Angeles Harbor Activities

The Marine Exchange of Los Angeles reports that for the month of October outbound shipments of petroleum totaled 4,015,696 barrels, as compared with 4,747,160 barrels in September, and 5,828,108 barrels in October, 1940. Water-borne lumber receipts totaled 81,465,000 board feet as against 72,492,000 in September and 32,849,000 in October, 1940.

Vessels arriving in October numbered 274, which compares with 319 in September, and 436 in October, last year. Of the October entries, 98 were in foreign and non-contiguous trades, 36 were intercoastal, and 140 were coastwise.

Banjamin Franklin Slides Off Ways

The third EC-2 ("Liberty") cargo steamer to be launched at the California Shipbuilding Corp., Terminal Island yard, was christened Benjamin Franklin and slid gracefully into the waters of Cerritos Channel, Los Angeles Harbor on November 16.

This ship is one of 55 building at this yard, which is making remarkable progress in ship construction. All the ships are identical. Each is to be equipped with two oil-burning, water tube boilers, supplying steam at 220 psi and 50° F. superheat to a triple-expansion, direct-connected steam engine driving the single propeller.

The engines are being built at Sunnyvale, California.

Out-of-door welding booths flood-lighted, Banning School, Los Angeles, where 560 welding trainees are being instructed.

Marine Engine Plant Leased to Pacific Bridge

The Pacific Bridge Company of San Francisco has leased the Thomas Machine Works at Los Angeles Fish Harbor to manufacture nine 1300-hp triple-expansion steam engines and other gear for the "coaster" type vessels allocated to the Pacific Bridge Co. by the Maritime Commission. Winches, steering gear, shafts, stern tubes, etc., will be made at this plant.

C-1 Agwiprince Passes Tests

The C-1 steamer Agwiprince is now on her maiden voyage with a cargo of lumber from Tacoma to Panama Canal. She was put through complete and exhaustive sea trials by the Maritime Commission and proved satisfactory in every way. A pictorial review of these trials appears on page 26, this issue.

Legislation Affecting Pacific Fishermen

Word comes from Washington to the effect that Congressional Bill H. R. 3254 may possibly be defeated. This measure would, among other things, require every fishing boat over 15 tons: to be inspected annually by the Steamboat Inspection Service; to carry a complement of licensed officers; to be fitted with water-tight cross bulkheads so arranged that the vessel would remain afloat with any one compartment open to the sea; and to carry radiotelephone equipment. It appears that this bill was introduced by representatives of fishermen operating out of the New England states, who must contend with long and heavy fogs, fish with hand lines from dories spread over a wide area of ocean from the mother ship, and in areas where bad weather prevails and collisions are frequent between fishing vessels and other craft passing through the fishing areas. Under such conditions, the requirements of this measure may be desirable, but the Pacific Coast fishermen contend that these conditions are not common to their operations and such burdens as the proposed bill would impose are not warranted.

Should this measure be enacted it could hardly be enforced under existing conditions without seriously hampering the operation of the fleets in all types of fishing. It is doubtful if the materials required for extensive remodeling of the boats would be available under the present priorities system. Many of the smaller boats would be forced to cease operation, as they could stand neither the first cost of alteration required, nor the increased expense of operation.

Motorship Ensenada Enters Reefer Service

Recently fitted with refrigeration in three hold compartments at San Pedro, the Mexican motorship Ensenada arrived in San Diego from Guaymas, November 14, with 85 tons of frozen shrimp on her initial voyage as a "reefer." The installation of refrigeration was made by the Gay Engineering Corporation of Los Angeles employing the Carrier system. The machinery consists of two four-cylinder Carrier compressors using Freon gas as a refrigerating agent, two Carrier cold diffuser units and two Gay condensers. This provides a duplicate installation either of which can hold the cargo space to a minimum of 10 degrees below zero.

The compressors are driven by the two Atlas auxiliary engines through multiple rubber V belts and are located in the engine room alongside the diesel auxiliary engines. The cold diffusers are located in the after end of the hold and diffuse the cold air by ducts led forward on each side and communicating with each of the three hold compartments. The three compartments are formed by two wooden cross - bulkheads fitted with large wooden insulated doors, and cargo is loaded through the one large hatch, located over the center compartment.

Shrimp is packed in 50-pound fiber cartons, 10 five-pound packages to the carton, and is frozen at the packing plant before loading. Cartons are loaded eight tiers high and the vessel has a capacity of approximately 140 tons. It is planned to ship about five million pounds of frozen shrimp annually, with the Ensenada making two round trips monthly between Guaymas and San Diego.

Mexican Ship Burns

On Sunday, October 19, the Mexican steamer Campeche was destroyed by fire in the harbor at Mazatlan, Mexico. Loaded with a cargo of sisal, the ship took fire about 2 a.m. and in a few minutes was on fire all fore and aft. The ship was anchored out in the harbor and the crew leaped overboard and were rescued by the Coast Guard.

The Campeche was built in Cadiz, Spain in 1934; was of 786 tons gross; and valued at about $250,000. For the past several years, she has been operating between Mexican Pacific Coast ports and California ports.

Japanese Relations Affect Tuna Boats

One hundred twenty-five thousand bamboo fishing poles a year is quite an order, and especially for one producer. When that producer happens to be Japan, and when the diplomatic relations with that country become strained to the breaking point, commerce, perforce, stops. When commerce stops, George Wallace of the American Fishermen's Tuna Boat Association gets a headache, for somehow the bamboo fishing poles, essential to tuna fishing, must be forthcoming. "Let George do it" is a too familiar phrase to Mr. Wallace, but he is combing the four corners of the earth in the effort to find a substitute for Japanese bamboo. However, the Azores fishermen, from whence most of the California tuna fishermen emanate, have been using the Brazilian bamboo with success and it may be that this pole is suitable for use in the Pacific. If it is, then Latin American relations may be further improved to the detriment, perhaps permanently, of Japan. Mr. Wallace is also exploring the Philippines and the Calcutta markets in the hope of securing the tough, heavy, long-fibered bamboo necessary to the Pacific tuna fishermen.

Priorities Puzzle

The Priorities Board has ruled that no Christmas toys or cards are to be given space in the holds of intercoastal freighters. The space is too sorely needed for the articles necessary to make our nation strong and able to defend itself against any invasion. At all costs, we must protect the "American Way" of living.

On November 2, the American-Hawaiian freighter Dakotan rambled into San Diego, loaded to the Plimsoll mark with articles and commodities essential to our protection and defense. Examination of her manifest revealed that she carried no Christmas cards, no Christmas toys, but she did carry some Christmas cheer in the form of 15,000 cases of Scotch whisky!

New Shipyard For San Diego

The Allied Shipbuilding and Engineering Corporation of Los Angeles announces that a shipyard is to be built on reclaimed tide lands at National City, adjoining San Diego on the south, where concrete and steel ships will be built. The Allied concern claims that they have been awarded contracts by the Maritime Commission for the construction of five concrete oil barges, to cost a total of $3,000,000. The barges will be 350 feet in length, with a beam of 54 feet, and without power.

It is expected the new yard will employ about 500 men, and will be arranged to build steel vessels as well as the concrete barges. The latter will be the first concrete vessels to be built on this coast since the last war. The company is negotiating with the Maritime Commission for some of the "Liberty" type ships but will start at once on the construction of the concrete vessels.

Yard Notes

The **Frank Hodgson** yard in Long Beach has laid the keel for another 90-foot tuna boat, a duplicate of the Viking, now in process of planking. Their first boat, the Monarch, built on their Terminal Island property, has been moved to the new Long Beach yard and is receiving the finishing touches.

In San Pedro, two old time windjammers are being fitted out to go to sea, both as six-masted schooners. At the **San Pedro Lumber Company** dock the ex-gambling ship Tango is being fitted out; and at the plant of the **Los Angeles Shipbuilding Company** the final touches are being put on the Star of Scotland which is expected to proceed to Puget Sound to load about the first of December. This famous old bark was originally the Kenilworth and made some fast passages for Edward Sewell and Company, and later for the Alaska Packers.

On November 3, at an early morning ceremony, the **Martinolich** yard, San Diego, launched the new tuna clipper Conte Grande with Miss Florence Castagnola, 17-year-old daughter of Frank Castagnola, owner, as sponsor. The new vessel is 135 feet long, 29 feet in beam and will be powered by a 750-hp diesel engine. Capacity will be 350 tons of fish under refrigeration, and the vessel will have a cruising range of 5000 miles. The launching of this boat leaves the Martinolich ways clear, and no more tuna boat construction will be undertaken for the present, pending a Navy Department decision concerning future construction.

At the **San Diego Marine Construction Company** there are four minesweepers well under way for the Navy, a diesel tug, the San Miguel, for the Star and Crescent Boat Company, and the keel has been laid for a 64-foot ferry, to be used by the Star and Crescent Boat Company in their North Island service. A steel barge, having a capacity of 9000 barrels, arrived at the yard November 14 for the installation of oil-pumping machinery and piping. Built at Pittsburgh by the **Dravo Corporation,** it was shipped, knocked down, to Stockton, California, where it was assembled and launched into the Sacramento. It will enter coastal service in tow of the San Miguel to relieve the tanker San Diegan.

Without any of the usual ceremony, the **Campbell** yard, San Diego, recently launched the 108-foot tuna clipper Queen Amelia for Tony Tavares and M. Ferriera. They have another 128-footer under way, but construction is being seriously delayed by lack of materials, and no definite launching date has been set.

Personalities

H. N. Browne, administrative officer of the Honolulu Harbor Commissioners, was a recent guest of San Diego Port Director **Joe Brennan** at an abalone luncheon. Mr. Browne was particularly interested in the yacht harbor at Roseville and stated that Honolulu port officials are having a difficult time finding suitable moorings for yachts and other private boats.

T. L. Dempsey of Los Angeles has sold his 120-ton diesel yacht El Vida to the Navy. The big twin-screw yacht is to be converted to a coast patrol boat.

A neat job of salvage was performed by **Carl Bruington,** of the Star and Crescent Boat Company, in removing the purse seiner Amelia II from the beach, a mile south of Del Mar, where she went ashore October 17 during a heavy fog. She broached in the surf and stranding broadside to the seas was buffeted by high breakers for several days. Carl hauled her high up on the beach clear of the surf and removed rudder and propeller. When weather abated, he obtained house movers gear and hauled the boat down the beach at low tide. Then, with the flood, he hauled her off with the tug Palomar. On drydocking, the boat was found to be only slightly damaged, requiring a new shoe and short length of keel aft. She sustained no planking damage, in spite of the fact she was rolled on her beam ends each way when on the beach.

Innis O'Rourke of Pasadena has sold his 26-ton auxiliary schooner yacht Sealove to the Navy for the sum of $1.00.

Russel C. Bremmer, president of the San Diego Passenger Association, at a convention meeting of 250 delegates of the Southern California Passenger Association and the Seven Seas Club, composed of representatives of steamship passenger companies, stated "We can see no immediate future for the passenger steamship companies." The business session was spent in trying to bring about a course of action to stimulate this vanishing trade; but all agreed that, under existing economic conditions and that to be expected after the emergency, there was little hope of reviving the once prosperous traffic.

Motorship Island Mail

(Continued from page 37)

pressure pumps which in turn discharge through Ross heaters to the injection valves.

Lubricating oil is pumped from the sump through Ross coolers either to the forced circulation system in the engine or to a storage tank through a battery of Sharples centrifuges and a Youngstown-Miller purifier.

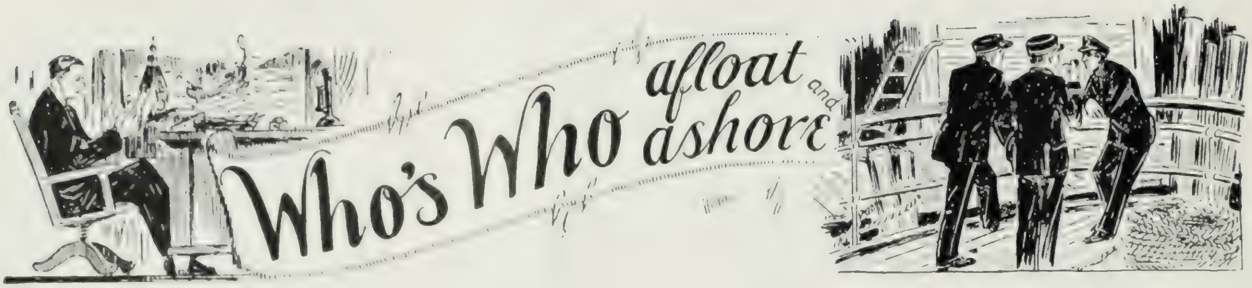
Fresh water cooling is used in a closed system with Ross coolers.

This main engine has a normal rating of 7500 bhp at 92 rpm, a continuous overall rating of 8250 bhp at 95 rpm, and a two-hour overload rating of 9375 bhp at 102 rpm.

Under normal operating and weather conditions at sea, developing 7500 shp, using fuel of 19,000 Btu content and with normal electric load on the auxiliary generating sets, this plant is guaranteed for an overall fuel consumption not to exceed 0.41 pounds per shp hour. The engine exhausts through a Foster-Wheeler waste heat boiler, which has a capacity for generating 7400 pounds of steam per hour at 125 psi, and which is so built that it can be used dry as a muffler for the exhaust. This boiler has a separate section for oil firing that is automatically thrown in whenever the pressure drops below 100 psi. This section has a full capacity for 8000 pounds of steam per hour.

For electric lighting and auxiliary power, there are three 400-bhp Bessemer diesel engines, each directly connected to a 250-kw Westinghouse generator. These engines exhaust direct to the stack through Burgess exhaust snubbers. They operate on same fuel as main engines, are fresh water cooled, and are entirely independent units.

An emergency lighting plant located on the boat deck consists of a 10-kw Superior diesel—Westinghouse generator set, arranged to be cut in automatically or by pushbutton control from the radio room whenever the voltage on main generators drops below a fixed minimum.


Who's Who afloat and ashore

Edited by Jerry E. Scanlon

Zac George

The position of Pacific Coast manager for the Intercoastal Steamship Freight Association, so capably administered by Zac T. George, has become more important during the emergency, a survey of the office reveals.

Despite the fact that the coast-to-coast fleet has been reduced by tonnage withdrawals some 50 per cent, movement of Government defense supplies is demanding all of the ability and experience of Zac George, generally conceded to be as able a steamship and tariff executive as could be assigned to the intercoastal trade.

There is a total of 250,000,000 feet of lumber to be moved from the Pacific Coast to Panama and other "outposts" of vital importance to the security of the Western Hemisphere. George is doing a major job in seeing that this commodity is moving on the schedule demanded by the United States Government.

In addition to this all-important task, George is handling all of the other regular details. Reports from shippers are that despite the ship shortage in this trade, essential products are moving. And while the situation is far from satisfactory, the efficient administration of George, working with the Army and Navy as well as the Maritime Commission, has been of such high character that he is responsible for the fine condition that exists on the Pacific Coast in this trade.

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Paul Bordwell

Called back from Shanghai and his return to his post as assistant vice president of the American President Lines indefinitely (due to the crisis at press time in the Far East), Paul H. Bordwell is making his headquarters in the San Francisco general offices of the company pending developments.

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Valencia Hero

Memories of one of the countless thousands of heroes of the sea were recalled by a recent visit to Seattle of John Segalos. His exploit thirty-five years ago, when the steamer Valencia was wrecked, wrote another chapter in the log of those whose disregard for their own safety to protect others is a tradition of the maritime world.

Segalos, now second assistant engineer voyaging out of Los Angeles, was instrumental in saving a score of lives of passengers when the Valencia went down on Vancouver Island, January 23, 1906. He saved eighteen lives on a make-shift raft he hurriedly built when his attempt to swim ashore from the Valencia with a life-line failed and nearly cost his own life. His trip to Seattle was to visit his niece, Mrs. Nicolleta D'Arielli, 402 Lucille Street.

Grace Line

Fred L. Doelker, Grace Line's vice president on the Pacific Coast, is in Washington conferring with Admiral Land and the other Commissioners seeking permanent tonnage for their "B" route—Pacific Coast to Mexico, Central and South America.

Early in the emergency, Grace Line's service on the West Coast was called upon for more drafted tonnage than any other Pacific shipping concern with comparable number of vessels. One of the major problems of Grace Line is to handle this season's coffee shipments to San Francisco, second largest coffee importing port in the world. To this end, Doelker seeks some emergency ships, but also desires to get vessels on a permanent basis to replace those commandeered, in order to stabilize their sailing schedules. Maritime Commission recognizes the "B" service as one of the essential trade routes.

Zac T. George

Arthur Poole Heads Propellers

Arthur Poole, newly elected Skipper of the Propeller Club, Port of San Francisco, takes over for the coming administration as Charles L. Wheeler (left) presents the official bell insignia of the organization

One has to know Arthur Poole, the newly elected president of the Propeller Club of the United States, Port of San Francisco, for some time to discover that beneath his rather stern manner reposes ready wit, a keen sense of humor and about as charming a host and all-around good fellow as one can find. Also, may we add, a keen mind and resolute character.

There is no affectation about the new head of the Propeller Club, and when his name was proposed for the office at the Palace Hotel luncheon, no one was as surprised as Arthur Poole.

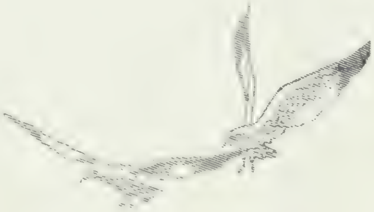
The recent Fifteenth Annual National Convention of the Propeller Club of the United States had much to do with bringing APL's vice president and treasurer into closer relations with the shipping leaders than he formerly enjoyed. Out of this convention, Arthur Poole's devotion to his duties as head of the finance committee directed attention to his accomplishments. His smooth and very successful handling of the job was the topic at many gatherings.

A wealth of experience is behind Mr. Poole. He was graduated from the University of Minnesota, we understand, but also took additional study at Harvard. He was at one time associated with Joseph Kennedy, the former U. S. Ambassador to Great Britain. Mr. Poole had much to do with untangling the financial affairs of a number of the major moving picture corporations, before he came to San Francisco and his present post at the urgent request of the late, beloved Joseph Sheehan.

We look for a fine twelve months for the Propeller Club under the guidance of Arthur Poole and his capable aides and board of governors.

San Francisco Propeller Secretary Eugene F. Hoffman (left) made the presentation speech awarding Edward H. Harmes, chairman of the recent National Convention, the silver service set pictured here

Other club officers chosen included Hugh Gallagher, operating manager for the Matson Navigation Company, as first vice president; Edward H. Harms, assistant operating manager of McCormick Steamship Company, second vice president; John E. Cushing, president, American-Hawaiian, third vice president. Eugene F. Hoffman, director of publicity and advertising for the American President Lines, was reelected secretary-treasurer.



New Board of Governor members for one year are: F. A. Bailey, executive vice president of Matson Navigation Company; Edward H. Harms, Marshall Levis, Arthur B. Poole and Charles Wheeler. Mr. Wheeler, executive vice president, McCormick-Pope & Talbot, retired as president, completing the most successful year in the club's history.

For two-year terms: Captain Henry Blackstone, Hugh Gallagher, George Jordan, Captain Lewis Mesherry and Joseph A. Moore. Three-year board members include: George A. Armes, John E. Cushing, K. H. Donavin, John T. Greany and Robert D. Spear.

Edward C. Maussbardt, district manager of the United States Maritime Commission, presented his department heads of the Coast District at the November 12th meeting of the Port of San Francisco Propeller Club. Introduced to a capacity audience were: Wm. Bernard, Materials Section, Technical Division; E. J. Bradley, Division of Emergency Shipping; M. E. Crossman, Division of Cadet Training; David Currier, Chief Inspector, Division of Construction; George Eggers, Field Representative, Division of Economics and Statistics; J. W. Massenburg, Pacific Coast Trial Board; K. S. Patten, Division of Finance; Wm. H. Quarg, Regional Chief, Construction Audit Section, Division of Finance; and James Scott, Division of Maintenance and Repairs

Old Timers

Sailormen of sailing ship days will be interested to learn that three famed windjammers have "come to life," two due to the exigencies of war.

The schooner Marie was reconditioned in San Pedro Harbor and six new 108-foot masts were fitted for the vessel by an Oakland shipfitting firm. Until acute tonnage conditions arose, the Marie had been serving as a gambling barge off the coast of Southern California.

The vessel was chartered to carry two million board feet of lumber from St. Helens, Oregon, last month to South Africa. This will be the first vessel to leave a Pacific Coast port for South Africa since the discontinuance of regular steamship service many months ago.

Now in Oakland Harbor, under jurisdiction of a historical foundation of that city, is the whaleship Charles W. Morgan, last New Bedford vessel of this type. She was towed here from the East Coast, where she has been anchored in Connecticut for the last 16 years as a memorial to whaling men. In her heyday the Charles W. Morgan wrote an epic chapter in the whaling era of the United States.

Catalogued to spend the rest of her days as a museum ship, war's tonnage demands have changed all this for the gallant sailing ship, Pacific Queen, best known to deep water sailors as the Star of Alaska.

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Ray Shiner

Ray Shiner, assistant passenger manager in New York for Grace Line, is arriving by airplane in San Francisco, December 31, with Mrs. Shiner, to spend the holidays with relatives. He is remembered as having started his passenger career in the San Francisco offices.

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Henry Bartlett

Henry G. Bartlett, of Los Angeles, is now West Coast shipping adviser to the Office of Production Management in Washington. He was business manager in Southern California for the Japanese shipping and industrial firm of Mitsubishi until the freezing of credits and embargo.

Appointments

Edward T. Senter, Marine Superintendent for the Grace Line, last month announced the following changes in personnel on various ships operating out of the Port of San Francisco:

Captain Charles T. Moritz is now master of the steamer Siletz. Perry Hirsch was named chief engineer. Karl J. Staus is the new Chief Officer. Donald F. Johnson, formerly third officer on the Flying Cloud, is the Siletz's second officer; Ray H. Johnson, who was second officer on the S. S. Scotia, is third officer; Samuel Kachalio, second assistant on the Flying Cloud, was named First Assistant Engineer; Cuvier Q. Roberts was appointed Second Assistant; Thomas Francis Ball was appointed Third Assistant Engineer; James E. McLaughlin, who has been purser on the Alcoa Patriot, Ogontz, Jupiter, Alcoa Puritan during the last six months, is now purser on the Siletz; Lou Harkness is the chief steward.

Robert Muth, who was freight clerk on the Santa Monica, is purser on the charter steamer Arcata, taken under charter by Grace Line for the coffee season. Purser of the motorship Cavalcade is William E. Fortune.

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Capt. Frank Dutton

The arrival in San Francisco last month of the new liner President Polk on her maiden voyage was the occasion for congratulations to Captain Frank Dutton by President Henry F. Grady of the American President Lines and other officials.

Shining like a Christmas coaster, the vessel is the seventh and last of the series of new C-3 type "P's" built by the Maritime Commission for the APL's round-the-world service.

While emergency restrictions curtailed the usual welcome to a new vessel, nevertheless arrangements were made for ship's officers to conduct small parties throughout the crack combination passenger and freight liner, constructed by the Newport News Shipbuilding and Drydock yards.

Fletcher F. Monson

Captain Dutton is another of the popular APL skippers. He joined the old Dollar Line, predecessor of the APL, in 1927, as third officer on the old President Van Buren. Since then he has served respectively as second and chief officer on the Presidents Taft, Jackson and Cleveland. He was chief officer on the President Adams when the vessel was taken over by the U. S. Navy. Dutton then served successively as master of the President Buchanan and Ruth Alexander.

His Chief Engineer on the new Polk is George Jackson, another veteran of Dollar-APL service. Harry Street is purser.

Captain Frank Dutton

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Mariner's Secretary

Unanimous approval was given the motion made to make Fletcher F. Monson, sales manager for the General Engineering and Drydock Company, secretary-treasurer for the Mariners Club of California. He is serving while Captain Stanley E. Allen is in Puerto Rico on Navy duty.

One of the best-known men in shipyard work around the Bay area, Fletcher Monson is noted for his refreshing personality and easy approach. His handling of difficult assignments in connection with numerous contracts with the Navy Department has won for him the highest regard of ranking Government officials of the Army, Navy and Maritime Commission, with whom he is in daily contact.

Left to right: Capt. L. H. Westdahl, A. P. L. Marine Superintendent; Cadet Lucine M. Brittain; E. C. Maussbardt, District Manager, West Coast Division, U. S. Maritime Commission

USMC Scholastic Award

It will be interesting to watch the career of Cadet Lucine M. Brittain, now attending engineering school at the Maritime Commission's base at Treasure Island. This brilliant youth, who served first on American President Lines' ships after preparatory training on the California school ship California State, is the possessor of his third commission award pin for high scholastic standing.

Cadet Brittain was last on the APL liner President Tyler. He has twelve months to go at school and will then undergo his examination for his license as third assistant engineer. His teachers state he is outstanding among student engineers in the nation's maritime training schools.

Capt. Walter Prengel

During the first World War, a personable young chap, restless because he was not old enough to enlist, and irked with office work, quit his job with the Zellerbach Paper Company and went out as cadet on a liner of the old Pacific Mail.

The first of December this same chap was appointed Port Captain of the Grace Line in New York, one of the busiest and most important posts in this world-wide steamship company's activities. He is Walter N. Prengel, who advanced through the grades until named commander of one of the new $4,000,000 "Santa" liners, the Santa Lucia, when this vessel, along with three sister ships, was placed in the intercoastal-Latin American trade in 1934.

Captain Prengel was born and reared in San Francisco. He learned seamanship under skippers and mates who were and are regarded as among the finest master mariners in the world. An adept pupil, Prengel continued with the Pacific Mail until Dollar Line bought the ships and service. Then he went with the Panama Mail. This concern was later taken over by Grace Line.

Captain Prengel's experience includes that of second and chief officer and later captain of the Panama Mail liner Venezuela, succeeding Captain Chester W. Gilbert. Captain Prengel's last ship before his present appointment was the Santa Paula, out of New York to Caribbean ports.

The shore-side promotion was given Captain Prengel when Captain Ahlin A. Anderson was advanced to the post of terminal manager for Grace Line. These promotions were brought about when another former San Franciscan left the latter position to enter the Navy. He is Captain Thomas Blau, who, some twenty years ago, was master of the liner Colombia in the transpacific trade at the time for Pacific Mail. This vessel was subsequently lost off the Mexican Coast while running for Panama Mail.

Captain Walter Prengel

NYK

The Japanese-United States crisis, with its consequent suspension of steamship services by Nipponese lines to the United States, resulted in the termination, the 15th of last month, of the services of two well-known officials of Nippon Yusen Kaisha in the San Francisco offices.

Harry Hornung, who has been some twenty years in New York and for the last ten of this period in the San Francisco headquarters, left as general freight agent. Leonard Lucas, advertising and contact man, also severed connections.

Douglas E. Dickie

Worthy scion of illustrious marine engineering - naval-architecture - shipbuilding forebears is Douglas E. Dickie, who is now shoreside after fifteen years of going to sea. Young Dickie is Service Engineer for Foster-Wheeler Corporation, the steam generator people, and is stationed at San Francisco where he is a capable "right-hand" for John Hoffman of the F-W division, under the jurisdiction of Robert D. Spear.

Son of David W. Dickie, dean of the naval architects on the Coast, nephew of Alexander J. Dickie, national authority on ship construction and marine engineering, grandson of the famous brothers George and James who were in on the founding of what today is Bethlehem at San Francisco, our subject is rightly endowed for his chosen career.

Douglas Dickie has been a familiar name in engine rooms of such fleets as American-Hawaiian, the Grace Line and the original Dollar Line.

He left his berth on an A-H motorship to study mechanical engineering at the U. C. in Berkeley and returned with M. E. honors to forge ahead until he achieved the coveted Chief's tickets for both steam and diesel.

He is a lieutenant in the Naval Reserve. Married, he lives in San Francisco.

Douglas E. Dickie

Capt. Chester Gilbert

Many times former shipmates and world travelers ask: "Whatever became of Captain Chester W. Gilbert?"

Captain Gilbert is now a successful operator of a good-size apple orchard in Sebastopol, Sonoma County. However, the tall—6 feet 5 inches—shipmaster saw to it, after retiring from the sea, that he was not too far away. He also has a Russian River home, and he may be found in this delightful recreation spot not alone during vacation months but on all holidays of the year.

The sea and Captain Gilbert parted some six years ago. His last command was the liner Santa Paula, but the ship of which he is most remembered as master is the gallant liner Venezuela.

The reason Captain Gilbert left the sea is that he took unto himself a wife in 1935, and thereafter was prevailed upon to remain shore-side. Captain Gilbert is a former San Franciscan by birth and long residence. He is remembered around the Olympic Club as one of the best centers that ever played basketball for the Winged "O."

Port officials along the Spanish Main, the water route that Captain Gilbert sailed in command of the Venezuela for so long, recall the skipper for his fine rendering of their favorite songs, as well as his skill as a guitar player.

While recounting Captain Gilbert's vocal and guitar playing, the entertainment of passengers and visitors while the ship would be in port in Spanish American countries, it is recalled that Harry Kelly, the purser, who was one of the finest violinists with a San Francisco orchestra before going to sea, and the two presented countless delightful musical sessions while on this vessel.

Captain
C. W.
Gilbert

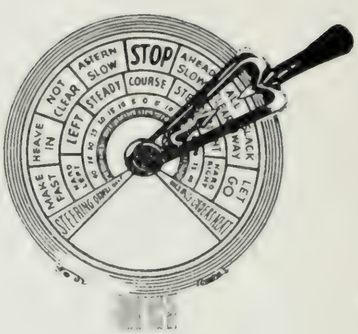
* * *

Chief Jim Burke

When the liner President Johnson arrived from her world trip, James "Jim" Burke completed his voyage as Chief Engineer of the vessel of which he has been First Assistant for so long. He took the place of William "Bill" Quigg, who left the vessel to take charge of the engine room on the steamer Charles Christenson.

Steady as you go!

KNOWLEDGE IS THE STRAIGHT COURSE TO ADVANCEMENT



A Department for Deck Officers

by "The Skipper"

Questions Welcomed. Just Address "The Skipper," Pacific Marine Review, 500 Sansome Street, San Francisco, California

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LETTERS FROM THE SHIPS

Dear Skipper:

I am a junior deck officer on a vessel sailing out of the port of San Francisco. Recently I have been studying the rules of the road and I notice that in Article II of both the International and the Inland Rules that "the length of a vessel shall be deemed to be that length appearing in her certificate of registry." I notice that this length is different from the length given on the vessel's blue prints, I am very curious to know how the length given in the vessel's certificate of registry is determined; I have asked several of the ship's officers but none of them seem to know the answer to my question. I wonder if you could give us the correct answer in a future article in your Steady As You Go series?

Yours truly,

H. D. G.

ANSWER

The length of a vessel as expressed in the Certificate of Registry, Consolidated Enrollment and License or License of Vessel Under Twenty Tons is determined by the following method:

The registry of every vessel shall express her length and breadth, together with her depth and height under the third or spar deck, which shall be ascertained in the following manner: The tonnage deck, in vessels having three or more decks to the hull, shall be the second deck from below; in all other cases the upper deck of the hull is to be the tonnage deck. The length from the forepart of the outer planking on the side of the stem to the after part of the main stern post of screw steamers, and to the after part of the rudder post of all other vessels measured on the top of the tonnage deck, shall be accounted the vessel's length. The breadth of the broadest part on the outside of the vessel shall be accounted the vessels' breadth of beam. A measure from the under side of the tonnage deck, amidships, to the ceiling of the hold shall be accounted the depth of hold. If the vessel has a third deck, then the height from the top of the tonnage-deck to the under-side of the upper deck shall be accounted as height under the spar deck. All measurements to be taken in feet and fractions of feet; and all fractions of feet shall be expressed in decimals.

For your further information on this subject, you should refer to the laws governing Inspection, Survey and Measurement of vessels; this can be found in Title 46, Sections 71, 72, 73, 74 and 75 of the Code of Laws of the United States, a copy of which should be on board your ship.

Dear Skipper:

This question may seem irrelevant and not within the scope of your regular discussion, however, we have argued the point—pro and con—but as yet we are all divided in our opinion; we have searched all available volumes and can find no satisfactory answer. Hence, both myself and the other ship's officers have decided to pass it on to you; that is, if you will consider such a question and give us an answer in your column.

What is the existing law regarding marriages on board merchant vessels on the high seas? Can the master of an American merchant vessel legally perform the marriage ceremony?

Yours truly,

H. J. S.

ANSWER

The law has long recognized the validity of marriages on vessels on the high seas before a master thereof, between persons who are competent to marry. Such marriages, however, *are not performed by the master,* but are civil contracts entered into by the man and woman and witnessed or attested by the master. If there is no impediment which would render the contract void, such as an existing spouse, then the marriage is recognized as valid.

The subject was carefully considered in the leading case of Fisher vs. Fisher by the New York Court of Appeals, and the principle with respect to the validity of marriages upon American vessels on the high seas is clearly set forth in the syllabus of such case: The law of marriage on board a ship at sea, recognized by 46 U. S. C. 201, providing for entry in the official log book required of vessels making voyages from any port in the United States to a foreign port, of every marriage taking place on board, is the law, *common to all nations,* which pronounces valid all contracts of *consensual marriage** between those who are, in view of all civilized people, competent to marry. A marriage on the high seas, witnessed by the master of a ship, flying the American flag, of a man and woman competent, in the view of all civilized people, to marry is valid under a Federal statute recognizing the *Common Law* as governing the validity of marriages on the high seas.

In brief then, it appears that there is no authority for a master to perform marriages on board a ship at sea, but rather the rule is that a *contract of marriage entered into before a master of a vessel at sea* between parties competent to marry will be recognized as a valid and lawful marriage. This rule is founded on long standing custom, common to all civilized nations, which has been adopted and approved by Congress with respect to American vessels.

However, it is better for the master to discourage such marriages, and, if possible, advise the parties concerned to wait until the vessel reaches port in order to have the ceremony performed by the proper authorities.

**Consensual*—A term derived from Civil Law, denoting a contract founded upon and completed by the mere consent of the contracting parties, without any external formality or symbolic act to fix the obligation.

RULES OF THE ROAD

3—Sound Signals for Vessels in Fog and Not in Sight of Each Other

Sound is often conveyed in a very erratic manner through the atmosphere; apart from the distortion of sound by the wind, large areas of silence have been found in varying directions and at different distances from the fog signal station. When sound has to travel against the wind, it may be thrown upwards; in such a case, a man stationed aloft may hear it when it is inaudible from the bridge.

The navigator should never assume:

1. That he is out of hearing distance because he fails to hear the sound.
2. That because he hears the fog signal faintly, he is at a great distance from it.
3. That he is near it, because he hears the sound plainly.
4. That the distance from and the intensity of the sound on any one occasion, is a guide to him for any future occasion.
5. That the fog signal has ceased sounding, because he does not hear it even when in close proximity.

When steaming in fog, the navigator should never answer too quickly the fog signal given by another vessel; immediately after sounding a fog signal, the hearing of those on the bridge is momentarily deafened by the noise. They are therefore unable to immediately hear signals from another vessel. After hearing a distant fog signal from another vessel, it is best to wait about one-half minute before blowing your own whistle, in order to allow the navigator on the other vessel to regain full use of his hearing.

Simultaneous Signals

It is possible that the fog signals of two approaching vessels be sounded simultaneously, in which event neither vessel would hear the fog signal of the other. This situation could exist if the two vessels were both using the automatic whistle, should the control switch of both whistles be set for the same time interval and put in operation at the same moment; then the signals would be synchronous, and neither vessel would hear the signal of the other.

QUESTION

What is moderate speed?

ANSWER

Every vessel shall, in weather of poor visibility, proceed at a moderate speed, having regard to the existing conditions (Article 16). The words "moderate speed," as used in the rules of the road, constitute a relative term which cannot be so defined as to apply in all cases; in fact, the flexibility of this rule is its safety. No vessel should proceed at a greater speed than that rate of speed that will permit her to maneuver herself safely out of any conceivable situation. Speed in fog is always excessive in a vessel that cannot reverse her engines and come to a standstill before she collides with a vessel that she ought to have seen, having regard to fog density.

The following circumstances and conditions for which careful regard must be had in determining what shall constitute moderate speed are:

1. The density of the fog and the condition of the weather for hearing fog signals.
2. Whether the vessel is in narrow waters or on the broad ocean.
3. Whether on fishing grounds or in frequented or unfrequented waters.
4. The readiness with which a vessel is able to maneuver.
5. The quickness with which the vessel can be brought to a standstill with the reserve of steam available for that purpose.
6. Her position with respect to tideways, currents or other dangers.

QUESTION

When should fog signals be sounded?

ANSWER

1. Fog signals should be sounded whenever the fog is so dense that an approaching vessel's side lights cannot be seen for a distance of two miles.
2. Fog signals must be sounded in sufficient time before a vessel enters a fog bank in order to give warning to any vessel that may be obscured in the fog bank. Smoke must be recognized as fog whenever it is so dense as to limit visibility and to make the use of fog signals necessary to insure safety.

QUESTION

Who has right of way in fog?

ANSWER

When steam vessels are obscured by fog and not in sight of each other, there

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UNITED STATES
DEPARTMENT OF COMMERCE
BUREAU OF NAVIGATION AND
STEAMBOAT INSPECTION

LICENSE TO CHIEF ENGINEER OF STEAM VESSELS

This is to certify that U.S. Engineer having been duly examined by the undersigned United States Local Inspectors Bureau of Navigation and Steamboat Inspection for the district of San Francisco, as to his knowledge of steam machinery and as to his experience and found to be competent is hereby licensed to act as Chief Engineer on — condensing — Ocean — steam vessels of any gross tons for the term of five years from this date.

Given under our hands this 2nd day of Jan. 1937.

cancelled

Your Problems Answered

by "The Chief"

"The Chief's" department welcomes questions—Just write "The Chief," Pacific Marine Review, 500 Sansome Street, San Francisco, California

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ENGINEERING THERMODYNAMICS

QUESTIONS FROM THE SHIPS

QUESTION

Dear Chief:

In September's Pacific Marine Review appeared Part 3 of your series "Engineering Thermodynamics." In your last question in this part you made a statement that isn't quite clear in my mind. You stated that the amount of steam used in heating the 10,000 lbs. of feed per hr. would be 1324 lbs. of steam per hour; that is entirely correct. Then you made the statement that 1324 lbs. of steam per hr. added to 10,000 lbs. of water per hr. will give you 11,324 lbs. of water per hr.

Now according to my figures, which I hope are correct, we have 1324 lbs. of steam being used at 10-lb. gage pressure (25 lbs. abs.). This will give us steam with a density of .0614 (Marks and Davis Tables), which worked out would be 1324 times .0614 equals 81.2936 lbs. of water. Now by adding this figure to our 10,000 lbs. of feed water, we get 10,000 plus 81.2936 equals 10,081.2936 lbs. of feed water per hr.

If these calculations are wrong, please put me on the right course.

Sincerely,

R. L. D.

"THE CHIEF'S" HOLIDAY MESSAGE

I want to take this opportunity to extend to all readers a most cordial holiday greeting. I know that all of you ashore or afloat are doing your share to support and defend the "American Way" of living. I, too, am putting in long hours at my assigned tasks. And so, at sea or at home, let us all be thankful for that spirit of Christmas, which we are so fortunate as to be able to enjoy.

A Very Merry Christmas and a Happy New Year to each and every one of you.

Sincerely,

"THE CHIEF."

ANSWER

This is a very well-worded question and is specially worthy of comment, because it expresses a befogged understanding of density and weight, which, from "The Chief's" many contacts with marine engineers, is quite general. The point involved is not easily clarified. If more of the engineers would have the courage, and it does take courage, to write in about their clouded conceptions, it would advance their understanding materially. Let every reader know that no problem in engineering is too simple, or too complex, to open up in these columns.

This question concerns the steam used in feed heating in an open heater where the heating steam mixes with the feed water so that the water out is more than the water into the heater by the amount of the steam used for heating. The steam adds both heat and water to the feed.

The steam is specified as steam at 23 lbs. absolute, and a quantity equal to 1324 lbs. per hour. This is all steam, a live hot gas, with, perhaps, a little fog or water droplets entrained in it. Its density, as indicated by the question, is very light compared to water; in fact, a cubic foot of it would weigh only .0614 lbs. as compared to a cubic foot of water weighing 62.4 lbs. The water weighs over a thousand times as much as the steam, per unit of volume. But, if we evaporate only one pound of water, about a pint, into steam at 25 lbs. absolute, it would occupy a volume 16.3 cu. ft., a tremendous increase in volume.

However, a pound weight of steam weighs one pound regardless of its volume or pressure. Thus, the pound of water evaporates into a pound of steam. A pound of steam condenses into a pound of water. And the 1324 lbs. of steam in the problem condenses into 1324 lbs. of water. The volume changes, but not the weight.

Unfortunately, the English system of weights and measures has many inconsistancies which require an alertness in their use. Also, we, as engineers, use the term pound to refer to a pressure as well as a weight. When used as a pressure, we should be careful to state pounds **per square inch.** Nevertheless, we state that the boiler carries 470 pounds of steam and presume that the **per square inch** is understood. In writing, we must be careful to distinguish between the two.

In discussing **rate** of steam **flow**, it is customary to refer to the **weight** of steam or water passing a given point **per hour.** This is obviously much better than referring to cubic feet or gallons, as the volume of both steam and water varies so much with temperature. In testing the steam rate of an engine or turbine, the exhaust is condensed and weighed at short periods and stated in pounds per hour. The weight of the water per hour is thought of as being the weight of steam per hour going **into** the turbine, or its steam rate, sometimes called its water rate.

EFFECT OF HEAT ON SOLIDS

In our last article we discussed methods of calculating the expansion of metals with temperature. The calculations were based on the assumption that the part was free to expand without restraint of any kind.

We now come to consider the cases where a piece tries to change shape or length but is restrained from so doing. Thus, instead of changing length, a change in loading or stress takes place. A good example is the hot rivet, with the locked up stress after it cools. This introduces the necessity of studying the effect of loading or stress on metals and the extent of stretching or deformation which takes place.

The forces set up in a body which tend or try to change its shape are classified into three groups. A force which tends to stretch or tear apart is called tension. A force which tends to squeeze or mash or crush is called compression. A force which tends to cause one part to slide over another is called shear, illustrated in the force on rivets in a boiler shell.

Furthermore, the words force, stress and strain must be clarified. When an external force is applied to a rod, a stress is set up in the rod to resist the force. If the force is great enough, the result is a strain or stretch or elongation. The stress is the resistance to deformation.

Unit force is the force in pounds per unit area (generally square inch) of the cross section of the body taken at right angles to the line of force and stress. Unit stress is also pounds per square inch. Unit strain is change in shape in the direction of the force measured as inches per inch of length under stress.

Modulus of Elasticity, E for Materials

Material	*E*
Aluminum	11,000,000
Brass, cast	9,000,000
Brass wire	14,000,000
Phosphor bronze	14,000,000
Copper wire	16,000,000
Iron, cast	12,000,000
Iron, wrought	27,000,000
Lead	1,000,000
Tin, cast	4,000,000
Steel (average mild)	30,000,000
Slate	14,000,000
Glass	8,000,000
Oak wood	1,500,000
Pine wood	1,900,000
Walnut	306,000

A stress of 20,000 lbs. per square inch on a piece of boiler steel causes a strain or elongation. When the stress is relieved, the strain reduces to zero; it springs back to normal. A stress of 60,000 lbs. per sq. in. on the boiler plate might not rupture it, but it might not return to its original shape when the stress is relieved. This would mean a permanent strain or set in the material—it would have been stressed beyond its elastic limit. In this condition the plate would be considered damaged, although it might be far from rupture.

The strain or stretch resulting from a stress is, in most materials, proportional to the stress, if less than the elastic limit. Thus, a steel wire coiled may be used as a scale to weigh materials, by measuring and calibrating its strain. The ratio of stress to strain is called the "modulus of elasticity" or "Young's modulus." Thus, if E is the modulus, or ratio of elasticity,

$$E = \frac{\text{Stress}}{\text{Strain}} = \frac{\text{lbs. per sq. in. load}}{\text{stretch inches per inch}}$$

in lbs. per sq. in.

Example: A steel rod 20 inches long, when under stress of 60,000 lbs. per sq. in., stretches .04 inches. the modulus is 60,000 ÷ .04 ÷ 20 equals 30,000,000 lbs.

Another expression for the modulus is that it is the lbs. per sq. in. which will stretch a bar one inch long to two inches long, assuming some hypothetical material which would stretch that much without losing in its cross-sectional area.

The modulus of elasticity is a measure of a material's stretch under load. This may be considered a measure of its strength, but not necessarily so. Glass has a modulus of one-fourth that of steel, yet we would not trust a glass wall for the boiler, even if four times as thick.

The accompanying table shows the modulus for some common materials.

To understand the relation between temperature expansion and stress due to restraint of expansion, consider the case of a 12-inch steam line passing through two bulkheads rigidly fastened to both, and, theoretically, the bulkheads cannot move apart. Then the steam is admitted to the line, which cannot expand. Then, obviously, there will be the same stress in the line as though it were free to expand, and, while thus expanded, it were squeezed up to the original length. As a rivet cools down, and at 600° F. becomes solid and tight, then cools to room temperature, it is under a tension, the same as though it were stretched from a length to which it

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Brickseal . . .

AN ARMOR PLATE FOR REFRACTORIES

Above: Brickseal completely seals and protects spalled and worn surfaces, as shown in this view taken from an oil-burning boiler.

●

Below: This shows how simply Brickseal may be sprayed, using Brickseal spray gun and air pressure.

The refractory brick linings of the furnaces of marine type boilers are subject to more severe usage than those boilers ashore. The boiler ashore is set on a firm foundation, and, barring earthquakes, tornado, or some other remotely possible natural phenomenon, its structure is subject only to the contraction and expansion caused by the cooling down for shut-down periods and the heating up for active periods. These expansion and contraction stresses are very frequently sufficient to make the refractory brick lining very inefficient and so to reduce the usefulness of the boiler.

The marine boiler is set in a more or less flexible structure which has a more or less heaving ocean for its foundation. Its refractory brick linings therefore are constantly subject to stresses and strains set up by the ordinary "working" of the hull, as well as the occasional pitching and tossing thereof.

Added to this mechanical "working," there is the further fact that the marine boiler is limited in its furnace space and the tendency is to work it at higher ratings than shoreside plants. "Working" causes erosion and wear; expansion and contraction due to rapid changes in temperature cause spalling, cracking and sometimes crushing.

Small cracks develop in the joints between the brick and the high-temperature mortar. These cracks admit furnace gases and these gases start a disintegrating action.

After several years of research in the high temperature refractory field, industrial chemists discovered a combination of high fusion point clays and metals which combined in oils make a perfect plastic seal, which is not affected by any chemical combination that exists in gases present in the industrial or marine furnace.

This product was named Brickseal and the Brickseal Refractory Co. was organized for its manufacture and sale.

The coating of new or old refractory furnace walls with Brickseal forms a highly glazed semi-plastic surface which accomplishes several desirable results:

First, it effectively seals all the pores and cracks in the surface of the refractory wall thereby preventing entrance of furnace gases;

Second, it is sufficiently plastic under heat so that it will not crack under expansion or contraction forces set up by differences in temperature;

Third, its insulation and reflective qualities deter absorption of heat by the refractory wall and reflect heat back into the furnace. On many installations, the application of Brickseal has been followed by a decided increase in firing efficiency due largely to this cause; and

Fourth, it forms an "armor plate" for the refractories, protecting them from the fierce punishment of the furnace fire.

Brickseal is a liquid of heavy consistency. It may be applied satisfactorily either with an air-spray gun or with a hand brush, after the furnace walls have been thoroughly cleaned with a scraper or a wire brush.

This compound is made in various grades and with different formulas. Each formula and grade is best adaptable to a certain range of operating temperatures. The standard grades with their vitrification points and maximum allowable temperatures are shown in the table herewith.

	Vitr. Temp. Deg. F.	*Max. Temp. Deg. F.*
Brickseal No. 1600	1450	2000
Brickseal No. 2000	1900	2600
Brickseal No. 2600	2500	2850
Brickseal No. 3000	2800	3200

Brickseal comes in five-gallon metal drums. It may be held indefinitely. It is being used satisfactorily today in practically every type of boiler in both the marine and the industrial power fields. It is used also in a wide variety of heat-treating and metallurgical furnaces under all types of firing conditions.

When walls are laid up with Brickseal, all joints are completely sealed and the entire wall is welded into one unit, as shown here.

News from Pacific Northwest

(Continued from page 40)

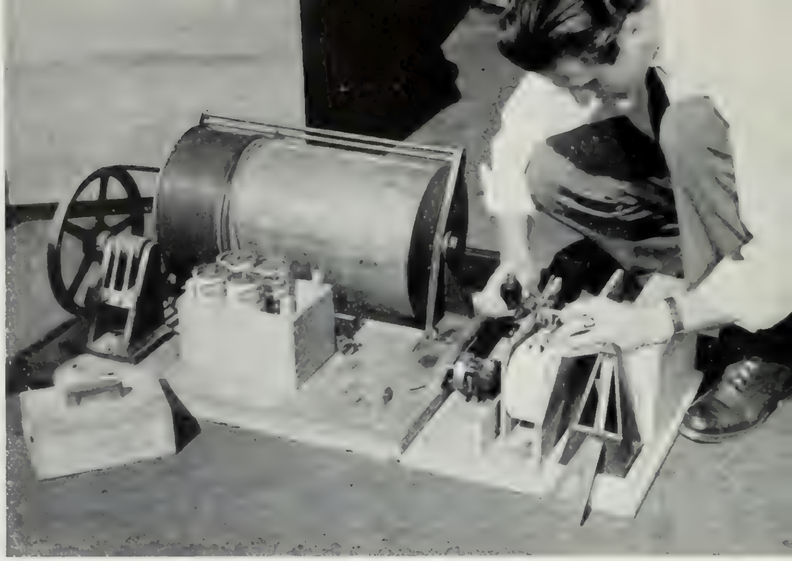
50 feet in length, with berthing and mess accommodations for about eight men, and a cruising speed of 12 knots. . . . Largest item for recent defense construction is for a new naval air base on Whitby Island at the foot of Puget Sound. $3,370,000 has been set aside to start this work, which may create one of the greatest naval air bases in America. Location is practically at the junction of Puget Sound and the Strait of Juan de Fuca and abreast of Cape Flattery. . . . Shipments from Alaska to the "outside" for October reached a total value of $11,719,000, a gain of 100 per cent over October, 1940. . . . Canned salmon is moving out of Puget Sound at a brisk rate at the present time. Of the total inflow of approximately 3,800,000 cases, two million have been shipped either by water or rail, leaving only 1,800,000 cases on hand, which, according to future booking will continue to move as long as cargo space is available. . . . **Albina Engine & Machine Works** of Portland seems to be the successful bidder for overhauling the U. S. Engineers' seagoing hopper dredge **Pacific,** asking $8,353 for the job. . . . Two ships, the **West Modica** and **Pacific Oak,** have been allocated to the **Grace Line** to serve Pacific Northwest ports with South America service.

Personal Gleanings

Winston J. Jones, manager of the **Alaska Transportation Co.** and one of the leaders in Seattle's shipping fraternity, has been called to the colors as a lieutenant, senior grade. . . . **Capt. "Zip" Wyatt,** Black Ball Line veteran skipper, always takes his vacation during the dog salmon run on Hood Canal, which is also often the foggiest season on the Sound. . . . **Lieut. W. A. Schoech** of the Sand Point Naval air station, was the featured speaker at the meeting of the Propeller Club on October 30. . . . Hobby of **Capt. Lindley Davis** of the **Puget Sound Tug & Barge Co.,** is listening in on the radio to the tugboat skippers around the Sound exchanging gossip over the radiophone. . . . **Mel Stewart,** assistant manager of the **Consolidated Olympic Line** is back on the job again after he made a journey of several weeks to Nome on the **Donna Lane.** That is, he went up on her, but the travel was too slow so he flew back. . . . **Capt. E. L. Bush,** well-known skipper of the U. S. Indian Affairs vessel **Boxer,** is back from Alaska on the last trip this vessel will make up there this year, as she has been taken over by the Navy. . . . Two well-known **American Mail Line** skippers went to Chester, Pa., to take over the two brand new freighters for the company. **Capt. John S. Smith,** formerly commander of the **Cape Alava,** took command of **Island Mail,** and **Capt. J. O. Story,** former commander of the **Cape Flattery,** will command the **Japan Mail.**

TACOMA PRODUCES A LAUNCH-O-METER

by D. L. Pratt



Wilton C. Smith adjusting the recording pens on his Launch-O-Meter

Beginning with the Cape Flattery, second of the program of five C-1-B motorships built at the Tacoma plant of the Seattle-Tacoma Shipbuilding Corp., the launching movement of each vessel has been measured by a new device, designed and developed by the technical staff of the shipyard and named by them the "Launch-O-Meter."

The original idea was born in the brain of Wilton C. Smith, and the description, diagrams and pictures making up this article came from interviews with that gentleman, who is a member of the technical staff of the shipyard.

The object of the device is to record simultaneously the movement of the ship down the ways and definite small intervals of time. Such records would show definitely and accurately the distance traveled and the time elapsed at any point of the ship's journey down the ways, and from this data could be derived by simple calculation the speed, the acceleration and the momentum at any point of travel. These characteristics would enable the technical staff to calculate with greater precision the various factors involved in launching a hull, such as drag weights necessary to limit water travel in restricted channels.

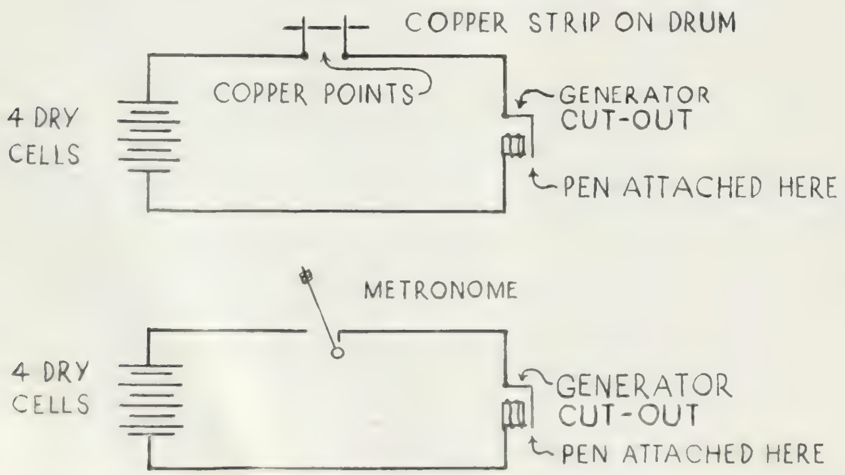
To accomplish the desired result, Mr. Smith, with the help of his associates, designed a drum on which could be wound sufficient wire to take the full travel of the ship. This drum revolves, of course, as the wire is drawn off by the movement of the cradle to which it is fastened. In rotating, the drum drives through belt connection a smaller drum which carries a make-and-break device hooked into a battery circuit that controls a generator cut-out. The armature of this cut-out supports a graph pen above a strip of stylograph waxed paper, which is moving over a spool driven at an appropriate speed by an independent source. At each revolution of the drum, corresponding to ten feet of travel of the hull, the pen actuated by the generator cut-out makes a mark on the paper. Another pen is supported by the armature of another generator cut-out whose electrical circuit contains a make-and-break contact which is closed at every stroke of the pendulum of an ordinary metronome. Thus, the second pen marks the intervals of one second, or any other convenient unit of time. The two series of marks thus produced give an accurate record of time and distance relationship for the travel of the hull down the ways.

For practical purposes as shown in the illustration, the Launch-O-Meter is made up in two sections, both of which are portable. One section contains the drum with its wire, the belt wheels and belt, and the smaller make-and-break contact drum. This section may be placed anywhere under the hull out of the way.

The second section contains the paper spool, the two pens, the metronome, the generator cut-outs and the battery. This section is usually placed under the launching platform, and the two sections are connected with an 80′ length of Tyrex No. 18 cable.

On the Launch-O-Meter, as built at the Tacoma yard, the main wire drum is built with a circumference of exactly 3 feet 4 inches. This drum drives the make-and-break contact drum through a three-to-one speed reduction, and consequently every 10 feet of wire running out results in a contact giving an impulse to the distance pen. About 1300 feet of wire are required and a reel 30 inches long will carry it single winding.

The diagrams show the two simple electric circuits. These are actuated by a six-volt current derived from a battery of four dry cells.



The distance and time recorder circuits of the Launch-O-Meter

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Bridgeport Brass

"ALL OUT" FOR NATIONAL DEFENSE

by Herman W. Steinkraus

Vice President, Bridgeport Brass Company

On October 27, at Bridgeport, Conn., there was held a simple ceremony wherein the United States Navy received from the Bridgeport Brass Company a suitably inscribed cartridge case—the twenty-five millionth cartridge case manufactured by that company. The U. S. Navy in turn presented that company with the coveted Navy "E," designating efficiency of operation. This article is an adaptation of the address made by Herman W. Steinkraus on that occasion.

On October 27, there was completed in our plant, inspected, packed, and made ready for shipment, the twenty-five millionth artillery cartridge case since we shipped the first pilot lot on January 26, 1940.

The first case made in this plant for the current Defense Program was the five-inch Navy shell case. We took over a large department where we had been making refrigerator parts and fire extinguisher shells, added a few special pieces of equipment, and began the production of this shell case, which requires close to 25 pounds of brass a piece. Since that day, we have stepped up production to six times our original schedule, and now our people are turning out this five-inch Navy shell case twenty-four hours a day, six and sometimes seven days a week.

Shortly thereafter, we were asked if we could make some seventy-five millimeter cases for the Army. We moved our trucks out of the old garage, put in presses, annealing furnaces and other equipment; and that garage today is a seventy-five millimeter unit, producing around 500,000 seventy-fives a month.

By this time, we began to feel that we had a definite skill to offer our Government, and when called upon to produce 1.1″ cartridge cases for the Navy, we bought up the land near us where there were some old saloons and a couple of old shacks, tore them down, and built a unit which is now producing one million medium size cartridge cases per month. These are the Navy 1.1″, the Army 37s, and two-pounders for the British.

When the twenty millimeter gun became such an important weapon for aircraft, the British asked us if we could set up equipment to make their twenty millimeter cases. We did, by moving out a few more departments, and in this gradual expansion finally pushed our office people right out of the old office building. The old executive floor, where our board of directors used to meet, is now occupied by several hundred men and women inspecting and packing Hispano Suizas and Oerlikon cartridge cases at the rate of well over one hundred thousand per day.

By this time our handling problem was becoming very serious. So we asked the city for the temporary use of a short street running through our property. This was promptly and gladly granted, and today we are handling in and out of that short street over sixteen carloads of cartridge brass a day.

Our plants and buildings are probably not the finest plants in the Defense Program today. They are crowded; they are cramped; every inch of them is being used—*but they have produced 25,000,000 cartridge cases!*

And this is only the beginning. The tempo of these plants has increased to the point where we will soon be turning out about eight million cartridge cases a month. Besides this, we are building here in Bridgeport a large cartridge unit for the Navy, and another plant at Indianapolis for the Army, which will mean many more cartridge cases for both branches of the service. Already, we are turning out sixteen different sizes and styles of artillery cartridge cases, and we are happy to be so serving the Navy, the Army, and the British Commission.

Just a word about our mills where we are still producing condenser tubes and other products for the Navy just as we have done for over fifty years. So, therefore, in a real sense, every department of our business has answered the call of the Navy, the Army, and our courageous friends, the British.

It is the teamwork of the whole brass company family that has made this record possible, and each and every employee has contributed some share.

Now, in behalf of these employees here present, and the thousands of others, who we wish could have been here, I have the honor of presenting to you this five-inch Navy shell case, suitably inscribed, as a token of the twenty-five millionth cartridge case produced by the Bridgeport Brass Company in Bridgeport, Connecticut.

Launch-O-Meter

(Continued from page 56)

The reel over which the paper is turned has a diameter of 4¼ inches and is driven at about 7.25 rpm. The paper, therefore, has a lineal speed of a little over 8 feet per minute.

"A few minutes before the ship is to be launched," said Wilton Smith, in describing the final use, "we start the paper rolling to check pens. Also, the metronome is then timed. A small piece of Scotch tape is handy for fine adjustments. Just as the ship moves, a mark is made in pencil on the chart to make a clear differentiation between actual happenings and the testing."

Shipbuilders will readily recognize the simplicity and yet the usefulness of the Launch-O-Meter. It has already served at the launching of the C-1s and C-3s, that the Seattle-Tacoma Shipbuilding Corp. have built, and Mr. Smith said it is the intention of the company to use it on all launchings in the future, with certain improvements that may suggest themselves from time to time.

On the Ways -

SHIPS IN THE MAKING

LATEST NEWS FROM AMERICAN SHIPYARDS

Pacific Bridge Co. Gets Nine "Coasters"

The Maritime Commission on November 1 closed a contract for nine small cargo vessels known as "coasters" at a total price of $8,550,000, to be built by the Pacific Bridge Company of San Francisco.

This is the fourth contract for this type of ship which has been made and brings the total of "coasters" under contract up to 36. The other companies, which are building nine each of these vessels, are Lake Superior Shipbuilding Company, Superior, Wisconsin; Leatham Smith Coal and Shipbuilding Company, Sturgeon Bay, Wisconsin; and the Penn-Jersey Shipbuilding Corporation, Camden, N. J.

The Pacific Bridge Company's yard is at Alameda, California. This is the first shipbuilding work this yard has done for the Maritime Commission. The company previously has engaged in general steel fabrication and drydock construction.

A "coaster" is a small freight ship of approximately 2800 deadweight tons. It is 258 feet 9 inches long, with a beam of 42 feet 1 inch and it has a draft of 17 feet 11 inches.

Bids were originally made for the construction of these ships by five companies but all bids were rejected and the contracts have been negotiated. The contract with the Pacific Bridge Company calls for deliveries starting July 7, 1942, and extending until March 4, 1943.

Thirty-Nine More "Liberty Ships" Named

Names of 39 more patriots, military and naval heroes, statesmen and other famous Americans have been assigned to ships of the rapidly-building "Liberty Fleet," the Maritime Commission announced in November.

In adopting a policy of naming "Liberty Ships" after men who have helped to shape the destiny of the United States and contributed toward its growth and development, the Commission feels that the ships will serve as an inspiration to present-day Americans. The ships will ply the seven seas and in so doing will spread the doctrine of Liberty.

The 39 vessels are among the 312 "Liberty Ships" now under construction. Previously, names for 19 vessels were assigned by the Commission. The first "Liberty Ships," the Patrick Henry, the John C. Fremont, and the Star of Oregon, were launched on September 27, and to date, seven have gone down the ways.

The shipyards, with the names assigned to the respective ships, follow:

Alabama Dry Dock and Shipbuilding Company, Mobile, Alabama

John Marshall, Chief Justice of the Supreme Court of the United States, 1801-1835.

Bethlehem-Fairfield Shipyard, Inc. Baltimore, Maryland.

Francis Scott Key, composer of the "Star Spangled Banner"; *Roger B. Taney,* Chief Justice of the Supreme Court, succeeding John Marshall; *Richard Henry Lee,* signer of the Declaration of Independence; *John Randolph,* Virginia Representative and Senator; *George Calvert,* colonizer and first Lord Baltimore; *Christopher Newport,* sea captain who safely transported a number of the first settlers from England to Virginia.

California Shipbuilding Corporation, Wilmington, California

Albert Gallatin, Secretary of Treasury under Thomas Jefferson; *Paul Revere,* famous for his "midnight ride"; *Oliver Hazard Perry,* naval officer who distinguished himself in the Battle of Lake Erie; *Daniel Boone,* pioneer and Indian fighter; *Elbridge Gerry,* signer of the Declaration of Independence; *Robert Morris,* signer of the Declaration of Independence and Government financier; *Rufus King,* twice United States Minister to Great Britain, 1796-1803 and 1825; *Samuel Adams,* signer of the Declaration of Independence

C-3 cargo-passenger steamer *African Planet* ready to launch at the Ingall's yard, Pascagoula, Mississippi

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and leader of the "Boston Tea Party"; *Nathan Hale,* Army Intelligence Officer who "regretted he had but one life to lose for his country"; *Zebulon Pike,* discoverer of Pike's Peak and explorer of the Louisiana Purchase; *Henry Knox,* Secretary of War, 1785-1795, and headed Navy Department when first organized in 1795.

Houston Shipbuilding Company, Houston, Texas

Sam Houston, Commander-in-chief of the Texan Army in its war for Independence and first President of Texas as an independent state; *Davy Crockett,* Texan hero of the Alamo; *Matthew Maury,* American Naval officer and hydrographer whose works on navigation, ocean currents, great circle sailing and wind are world standards; *Winfield Scott,* an outstanding American General who participated in both the War of 1812 and the War with Mexico, 1846; *James Oglethorpe,* founder of the colony of Georgia and the city of Savannah.

North Carolina Shipbuilding Company, Wilmington, North Carolina

Charles C. Pinckney, famous for his statement, "Millions for defense, but not one cent for tribute"; *Edward Rutledge,* signer of the Declaration of Independence; *William Moultrie,* Army officer in the Indian and Revolutionary wars; *Daniel Morgan,* commander of a company of famous sharpshooters during the Revolutionary War.

Oregon Shipbuilding Corporation, Portland, Oregon

Philip Livingston, New York signer of the Declaration of Independence; *Alexander Hamilton,* Secretary of Treasury under George Washington;

First "Liberty Ship" named was the *Patrick Henry,* shown here just after launching September 27, at the Bethlehem Fairfield yard

John Jay, first Chief Justice of the Supreme Court; *Thomas MacDonough*, Naval officer who achieved the brilliant victory of Lake Champlain; *Robert Fulton*, inventor of the first successful steamboat; *William Dawes*, who accompanied Paul Revere on his famous ride, but who was captured by the British; *Philip Schuyler*, American soldier and statesman; *Stephen A. Douglas*, statesman-lawyer who debated with Lincoln.

Richmond Shipbuilding Corporation, Richmond, California

Zachary Taylor, twelfth President of the United States; *Anthony Wayne*, hero of the brilliant storming of Stony Point; *Timothy Pickering*, founder of West Point Military Academy.

South Portland Shipbuilding Corporation, South Portland, Maine

John Winthrop, Massachusetts colonizer and governor.

November Launchings

The Maritime Commission announced the launching of the following seven ships from United States shipyards during November:

A. C. Rubel, 12,000 dwt. tanker; launched November 10 at **Bethlehem Steel Company's Sparrows Point** yard; sponsored by **Mrs. Albert C. Rubel,** wife of an official of the Union Oil Company, California—for which it is being built.

Benjamin Franklin, EC-2 cargo ship; launched November 10 at **California Shipbuilding Corporation,** Terminal Island, Los Angeles Harbor, California; sponsored by **Miss Dorothy Barnes,** daughter of James E. Barnes, Washington representative for the Todd Shipyards Corp.

S. S. Jean Lykes, C-2 cargo ship of 9400 dwt with designed sea speed of 15½ knots; launched November 12 at **Federal Shipbuilding and Dry Dock Co.,** Chester, Pa.; sponsored by **Mrs. Hale Boggs,** wife of Congressman Boggs of New Orleans; built for **Lykes Brothers Steamship Co.,** New Orleans.

Calusa, 15,910-dwt. tanker with liquid cargo capacity of 133,000 bbls.; launched November 12 at the **Bethlehem Steel Company's Sparrows Point** yard; sponsored by **Mrs. Laurence B. Levi,** wife of one of the directors of **Socony-Vacuum Oil Company, Inc.**—owners of the ship (third launched of a fleet of six identical tankers building for this operator).

Francis Scott Key, EC-2 cargo ship; launched November 15 at **Bethlehem-Fairfield** yards, Baltimore, Maryland; sponsored by Mrs. William D. Byron, Maryland Representative in Congress.

S. S. Fairport, 9600-dwt. cargo ship (one of four identical ships building for the same operator); launched November 15 at the **Gulf Shipbuilding Corporation's** yard, Chickasaw, Alabama; sponsored by **Mrs. Edw. A. Roberts,** wife of president of **Waterman Steamship Corp.**—for which the ship is being built.

Robert Gray, EC-2 cargo ship; launched November 16 at **Oregon Shipbuilding Corp.** yards, Portland, Oregon; sponsored by **Miss Mary A. Reilly,** daughter of the president of Todd Shipyards Corp., New York City.

Five of these seven ships are in the Maritime Commission program and make a total, to date, of 153 launchings in that program.

Four More U. S. M. C. Vessels Delivered

Four more new ships for the American merchant marine were delivered into service during November, as announced by the Maritime Commission.

The **S. S. Robin Wentley,** a C-2 cargo ship of 10,048 deadweight tons, and designed sea speed of 15½ knots, was delivered to the **Seas Shipping Company Inc.,** of New York City, by the **Bethlehem Steel Company's** Sparrows Point, Maryland, yard, November 3. It is the last completed of a six-ship fleet for this company, two of which have been turned over to the Navy.

The **S. S. President Polk,** a C-3 passenger-cargo ship of 9937 deadweight tons, designed sea speed of 16½ knots, and 96 passenger capacity, was delivered November 6 to the **American President Lines, Ltd.,** of San Francisco, California, by the **Newport News Shipbuilding and Dry Dock Company** at Newport News, Virginia. This is the last of seven identical ships built at the same yard for this operator, three of which have been acquired by the Navy.

The **S. S. James McKay,** a C-1 cargo ship of 9260 deadweight tons, and designed sea speed of 14 knots, was delivered November 7 to the **Lykes Brothers Steamship Company Inc.,** of New Orleans, Louisiana, by the **Bethlehem Steel Company's Sparrows Point,** Maryland, yard; the last of five identical ships built for this operator by the same yard.

The **S. S. Agwiprince,** a C-1 cargo ship of 9290 deadweight tons, and designed sea speed of 14 knots, was delivered November 10 to the **New York and Cuba Mail Steamship Company** of New York City, by the **Consolidated Steel Corporation, Ltd.,** at its Long Beach, California, yard. This is the second identical ship delivered to the same operator by this shipyard.

These deliveries make 122 ships completed in the Maritime Commission's long-range program.

Six "Liberty Ships" Allocated

Allocations of six additional "Liberty Ships" to American steamship operators were announced in November by the United States Maritime Commission.

The **Patrick Henry,** one of the first "Liberty Ships," launched on September 27, at the **Bethlehem-Fairfield yard,** Baltimore, Maryland; the **Thomas Paine,** being built by the **California Shipbuilding Corporation,** Los Angeles, California; and the **John Barry,** under construction by the **Oregon Shipbuilding Company,** Portland, Oregon, will be chartered by the **Lykes Bros. Steamship Co., Inc.,** New Orleans, Louisiana.

The **Isthmian Steamship Company,** New York City, will charter the **Benjamin Franklin,** to be delivered by the **California Shipbuilding Corporation;** and the **William Clark,** being built by the **Oregon Shipbuilding Corporation.**

The **Robert Gray** will also be delivered by the Portland yard for charter by the **Waterman Steamship Agency, Ltd.,** New York City.

Third "Modified Exporter" Launched

The American Export Lines' fast freighter, Exanthia, launched November 1, at Bath Iron Works Corporation, was sponsored by Mrs. James J. Brazil, Russell, Kansas, daughter of John Wright, the operator's claims and insurance manager.

The third of four vessels of the "modified Exporter" type, designed

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and engineered by American Export, the Exanthia is 420 feet in length, with 60-ft. molded breadth and 39 ft. 4 in. depth molded to main deck amidships. Cargo capacity is 6597 gross tons.

Captain Carroll M. Macgowan of Portland, Me., who has been appointed to command the Exanthia, has served as captain of several American Export vessels, including the Extavia, recently completed sister ship.

One-Fourth of "Liberty Ship" Keels Laid

With the laying of 21 keels during October, keels for virtually one-fourth of the 312 "Liberty Ships" under construction have been laid, bringing the total to date from the first keel laying, April 30, 1941, to 76, according to the Maritime Commission's Program Construction Report made public in November.

Of the standard type ships, six were delivered during October and four others launched, with the records standing at 57 deliveries and 51 launchings for ten months of this year, as compared with 41 deliveries and 54 launchings for the full 12 months of 1940.

New Yard for Stockton

A privately financed shipyard to be built at Stockton, California, costing between $2,000,000 and $2,500,000, for the construction of 30 10,000-ton tankers, was announced in November by B. J. Klarman, president of the Star Engineering Company of New York.

According to Mr. Klarman, contracts for the first 30 vessels were already completed, and the tankers will be for both the United States and Great Britain.

Submarine Keel Laid at Mare Island

On November 10, the keel for the submarine U. S. S. Tunny was laid at the Mare Island Navy Yard. This is the fifth submarine keel to have been laid this year, being preceded by the Trigger, Wahoo, Whale and Sunfish. It is also the third submarine to occupy Way 3 during 1941, which indicates the fast production of this yard.

Bethlehem S. F. Yard Launches Destroyer

The destroyer Woodworth was launched on Saturday, November 29, at Bethlehem's San Francisco yard.

The Woodworth was named for the late Commodore Selim E. Woodworth, USN, whose spectacular career is linked with early history of California as well as of the United States Navy.

Newest Atlantic Tanker Launched

The S. S. John D. Gill, a 19,200-ton tanker, and the newest addition to The Atlantic Refining Company fleet, was launched November 15 at the yards of the Sun Shipbuilding and Dry Dock Company, at Chester, Pa. Built in record time because of the war-time shortage of tank ships, the big vessel slid into the water just 18 weeks after the first keel plate was laid.

The ship was sponsored by Mrs. John D. Gill, wife of an Atlantic director, in whose honor the vessel was named.

American Shipbuilders

IN NATIONAL DEFENSE

A recent survey and field inspection of the shipbuilding ways and other facilities of this nation, conducted by the National Council of American Shipbuilders, an organization including approximately 80 per cent of the privately-owned shipbuilding capacity of this country, indicated the extent to which the shipbuilding industry of America was meeting the herculean task imposed upon it by the expanded programs of the Navy and the Maritime Commission.

Since May of 1940, when Adolph Hitler overran the low countries of Europe, Congress has authorized an 11 per cent and a 70 per cent increase in the Navy of the United States. This meant a virtual doubling of the size of our Navy in all categories of vessels. There was also superimposed on the long-range program of the Maritime Commission, which originally contemplated the construction of 50 merchant vessels a year over a ten-year period, the construction of 60 merchant ships for British account, 61 vessels for strictly private account, and 348 cargo carriers of simplified design known as "Liberty Ships."

To accomplish all of this construction, a vast program of expansion of existing shipyards and the construction of new additional facilities became necessary. Both the Navy Department and the Maritime Commission very wisely adopted a policy which contemplated first the expansion of existing facilities to the utmost and only opening new yards under experienced management. No encouragement was given to quickly thrown-together organizations of limited management experience and financial stability. It was only through such a policy as this that construction of ships of the highest quality completed in the shortest possible time was possible of achievement.

When the emergency started, there were only 21 private shipyards engaged in the construction of steel seagoing vessels. These yards had available 83 active shipbuilding ways of 300 feet or more in length. Today there are some 65 yards engaged in this work, not counting the numerous smaller organizations constructing small craft. These 65 yards have available today 383 shipbuilding ways of 300 feet or more in length that are completed. These facilities are spread along the Atlantic and Pacific seaboards, the Gulf Coast, the Great Lakes, and on the banks of our great rivers. The spreading of this work over this wide area was possible only because Congress gave the two principal governmental agencies involved in shipbuilding, the Navy Department and the Maritime Commission, the power to negotiate contracts—a system used in England for a number of years in connection with their naval shipbuilding contracts.

Today there are 775 seagoing merchant vessels and 503 combatant and seagoing auxiliary naval vessels under construction in the privately-owned shipyards of America. These yards are employing approximately a quarter of a million workers as compared to sixty-five thousand, the number before the emergency. This tremendous increase in workers was, of course, impossible of accomplishment without a great dilution of supervisors and skilled artisans with some consequent inefficiency. This situation is being rapidly overcome by the training of workers in private industry and under governmental auspices.

Excellent records are being made in the construction of all types of ships, both naval and commercial. The estimated contract building times of naval craft have been reduced from a matter of months to as much as a year. An excellent illustration of the reduced building time of merchant vessels was the recently completed S. S. Ocean Vanguard, a 10,500-ton deadweight cargo ship which was delivered in six and one-half months after the laying of her keel. It formerly took ten months to a year to build a vessel of comparable size. The employment of additional workers, the use of shift work, improved techniques, standardization of design, decentralization, spreading the work and use of experienced management have all contributed to reducing the building time of ships in the present program.

Steady As You Go!

(Continued from page 51)

is no right of way. The fog signals are intended solely for the purpose of indicating the presence of one vessel to the other; the burden is upon each vessel to cautiously avoid collision with the other; and passing signals cannot be used until the vessels are in sight of each other.

When hearing the fog signal of another vessel, apparently forward of the beam, your engines must be stopped immediately and, unless circumstances make it impossible to do so, kept stopped until the true position and course of the other vessel is ascertained; then the two vessels will carefully proceed to make a safe passing.

QUESTION

How do I know deceleration and the turning circle?

ANSWER

Every master should have posted on the bridge an approximate deceleration table at various speeds and drafts of his vessel. This is frequently neglected on merchant vessels, but definite knowledge as to the turning circle and the time and distance required to bring his vessel to a complete standstill will always be of value to any officer when called upon to defend his vessel after a collision.

In our next issue we are including Tables B and C; Table A, sound signals for vessels in sight of each other, was published last month. Table B gives sound signals for vessels not in sight of each other while obscured in fog. Table C gives sound signals for steam vessels not in sight of each other in clear weather.

Maintaining SAFETY STANDARDS UNDER WAR CONDITIONS

by Commander Richard S. Field

Director, Bureau Marine Inspection and Navigation, Department of Commerce

It is the duty of our bureau, through regulation and inspection, to see that vessels are protected against the hazards of fire, collision and stranding. It is our duty to see that they are manned by officers and crews competent to operate them with safety. Against the hazards of enemy action, their defense is in the hands of the Navy. If in spite of naval protection an enemy should succeed in damaging one of our ships, its personnel and material will be put to the test. A well-trained crew with adequate fire-fighting equipment in a vessel properly subdivided will have a chance to save the ship, or, if it must be abandoned, they will take to the boats in an orderly manner. To this extent the Bureau of Marine Inspection and Navigation, by regulation, inspection, and drill, participates in the defense of our merchant vessels against a shooting enemy.

The Maritime Commission's long-range program was made up of passenger and cargo vessels designed by the Commission. Every detail of the construction of these vessels was in excess of all requirements, either of the 1929 Convention, or of the laws of this nation or any other. The adoption by the Commission of such standards greatly facilitated the administration on the part of this Bureau of the regulations which we have made concerning the construction, fire detecting and fire-fighting and lifesaving arrangements in all passenger and cargo vessels. When the Maritime Commission, faced with the necessity of augmenting their regular program, with the construction of the "Liberty Fleet," advanced the proposal that these emergency ships should in some slight particulars be built below the standard of their regular program, they met with the immediate agreement of the Bureau of Marine Inspection and Navigation. The bureau is satisfied with the adequacy of these vessels for the service in which they are to be used, and all agree that they are superior to the average cargo vessel built before 1936.

Early in the summer of 1941, the national interests required a deeper loading of the American merchant fleet during the emergency, and with the record of thousands of voyages made before the load line laws were enacted, we were certain that deeper loading of vessels structurally qualified could be accomplished and within the limits of safety. The amended Coastwise Load Line Law was signed by the President July 3, 1941, and by July 7, some one hundred tankers, thanks to the American Bureau of Shipping, had their new deeper marks and on Tuesday, July 8, the deeper laden vessels began to leave Gulf ports. This has resulted in the delivery of approximately fifty thousand barrels more per day on the Atlantic Coast. Early in August, the President suspended the terms of the International Load Line Convention and the Secretary of Commerce issued new load line regulations, the effect of which was to load vessels one mark deeper, except in the winter season or zone. Neither your Marine Inspection Bureau nor the American Bureau of Shipping is made up of "yes" men. The classification societies, upon receipt of a request for a deeper loading amendment, go very carefully into the record of the vessel, considering its age, strength of hull, protection of all openings and every other detail, before granting a lesser freeboard. In each case there must be a finding by the Bureau of Marine Inspection and Navigation that the amended freeboard is within the limits of safety. Moreover, when the emergency is past, we shall insist upon going back to the old marks.

Faced with an acute shortage of able seamen, we fostered the Act of September 24, 1941, which permits that one-half of the able seamen required in a vessel may be twelve months able seamen, or what is commonly called "blue ticket" A. B.'s. The result of this act, which is for the duration of the emergency only, spreads the available unlimited, or "green ticket" able seamen, over one and two-thirds the number of vessels which they could man before the act was passed. Thus, if the available unlimited able seamen last month could man six hundred vessels, that same number can now man one thousand vessels.

Because of the extraordinary number of different situations presented to us in which some slight waiver of existing laws would greatly facilitate the movement of commerce, we went to Congress, with the approval of the President, with a bill known as H. R. 5111. This bill as it passed the House would authorize the Secretary of Commerce, upon request from certain designated offices, including the Navy and War Departments and others, to waive any of the inspection or navigation laws after a finding that such waiver was necessary for the national defense. There is no intention, should this bill become a law, to set aside any of the safety requirements nor to take any action except in individual cases to facilitate commerce by the

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removal of some technical prohibition not involving safety.

We have read considerable of a new emergency type of vessel known as the Sea Otter. We have seen no plans of this proposed craft, and no one has approached the Bureau in any way in connection with it. If it is successful, I have no doubt it will be of tremendous help in accomplishing the immediate purpose of our Government. Therefore, I hope that when and if this novel type of vessel is offered for certification it may be found to be in accordance with the requirements of the law.

There is under consideration at the present time the building of a large number of concrete barges for the transportation of oil. The existing tanker regulations require that all new tank vessels be constructed of steel or iron. We have indicated our willingness to approve a concrete and steel oil barge, provided certain essentials are included. As regards the proposal that such barges might be towed unmanned between the Gulf of Mexico and the east coast of the United States, we have not been able to agree. Our views on this matter have been supported by the Coast Guard, by tanker operators, and almost unanimously by all towing authorities.

In these confused times safety in the operation of our merchant vessels has a direct bearing on the final effectiveness of the defense effort. It is apparent that for the long pull the country needs to maintain in all respects the dependability and quality of its merchant fleet in order that all vessels may be continuously and efficiently operated with a minimum loss of bottoms and of time from casualty or breakdown. Further, it goes without saying, that merchant vessel personnel having the knowledge that orderly and effective precaution has been taken against all types of accident, will perform their duties with confidence and corresponding thoroughness.

I believe that the majority of our citizens would insist upon two general protective precautions: one, that we maintain during this emergency that standard of marine safety which is necessary to assure the safe and efficient operation of American merchant vessels; and, two, that these vessels proceeding on their lawful occasions should be fully protected by the might of the United States Navy.

Abstract of an address before the American Merchant Marine Conference, San Francisco, October 22.

Protective Control Device for Arc Welders

Complete protection against heat or excessive current, or both, is provided by a new protective control device for arc welding machines just announced by The Lincoln Electric Company.

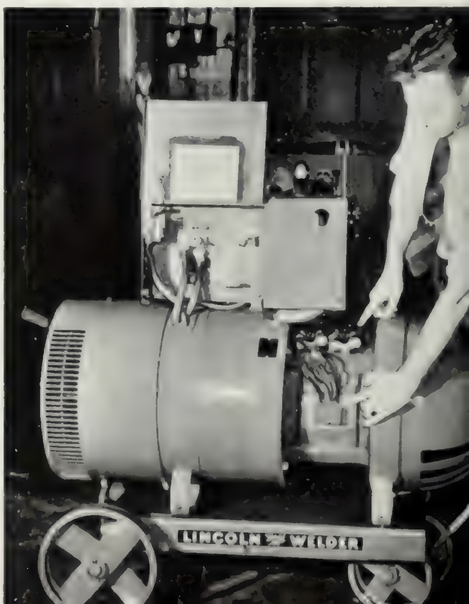
The protective control device consists of two current transformers, the primaries of which are connected in series with the motor leads, and the secondaries supplying power to operate two snap-action thermostats which are mounted directly on the motor lamination in such a way that they operate by means of heat conduction as well as by current passing through the thermostat.

The protection provided by this device is as follows:

1. If the welder is being operated in a very hot room, or an oven, and it exceeds the safe operating temperature, thermostats will trip open;
2. If the motor is cold and excessive currents which will eventually damage the motor occur for a short period of time, the thermostat will operate before the motor reaches an unsafe temperature;
3. If the machine is started on single-phase lines, the switch may close, but the excessive heating of the thermostat caused by the single-phase locked current will open the thermostat and stop the machine;
4. If the machine is running and one fuse blows so that the motor is operating single phase; if the load on the machine is sufficient to overheat the motor, the thermostats will trip out;
5. If the rotor is locked with normal three-phase power applied, the thermostats will open the circuit due to the high current;
6. If the welder is operated for long periods of time at sustained overloads, both high input current and high motor temperature combine to open the thermostats.

The thermostats automatically reset when the motor returns to a safe operating temperature, or when the current is reduced, and no manual operation is required to start the machine, except pushing the start button.

A special circuit allows the starter button to be held "in" after the welder thermostats have been tripped. This allows the machine to rotate with no load, and the welder ventilation speeds up the cooling of the welder after the trouble has been rectified.



E. J. Bradley

New Pacific Appointment for Emergency Ships, USMC

Result of the appointment of E. J. Bradley as Pacific Coast representative for the Division of Emergency Shipping, U. S. Maritime Commission, is highly gratifying, shipping executives unanimously report.

The tall, reserved, former Assistant Freight Traffic Manager for the Matson Navigation Company, is one of those chaps who succeed in getting things done without any apparent effort. We wish to record that shipping leaders say that Bradley's position is anything but an easy one. Especially to please all sides, what with the demand for cargo space and the lack of tonnage on this range.

Army and Navy offices substantiate what the merchant marine executives say in behalf of Bradley. His job, among others, is to cooperate with the Army and Navy with the defense construction contractors in the movement of materials.

Local shipping men say that with Bradley's appointment there immediately was instituted a closer cooperation with Washington and the Pacific Coast in problems affecting vital handling of shipping. And the situation is constantly improving under the impartial and efficient handling of Mr. Bradley, who brought to his government post sixteen years' experience as one of Matson's outstanding traffic experts.

* * *

Capt. Tom Smith

Captain Thomas Smith, San Francisco Bar Pilot, has been called into service by the Navy and is now stationed at Treasure Island base with the rank of Lieutenant-Commander under Captain Ross Culp.

One of the most popular master mariners of the Bay Area, Captain, or rather Lieutenant-Commander, Smith is remembered, prior to his appointment as pilot, as master of the United Fruit Company's vessels plying out of the Port of San Francisco in the Central American banana trade.

With Propellers

At the meeting of the Propeller Club of the Port of New York last month, Commander Lee resigned as Port President in order to devote more of his time to his new position as National President. He was succeeded by O. B. Whitaker, Manager of the Marine Sales Division of the Sperry Gyroscope Company, who lives at 25 Monroe Place, Brooklyn. Mr. Whitaker served last year under Commander Lee as Vice President of the New York Club. He is a veteran member of the Propeller Club.

* * *

Organization of the eighty-first branch of the Propeller Club of the United States at Hueneme, California, was announced recently by Commander Robert C. Lee, National President of the Club. One of the Maritime Commission's newest training stations is located at this port.

* * *

Necrology

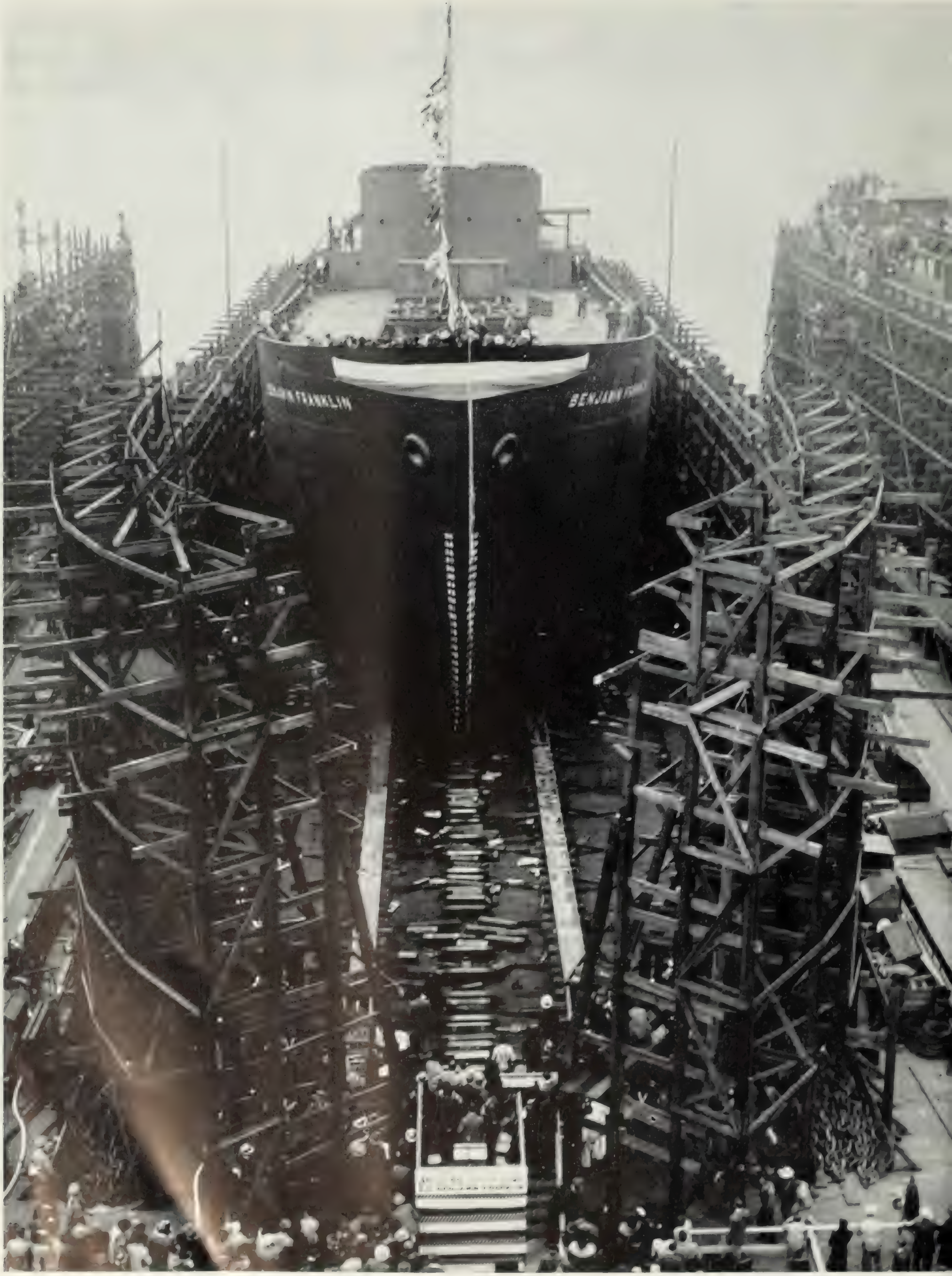
Pacific Coast friends learned with regret the passing on November 13, in Tampa, Fla., of Thompson M. Lykes, vice president and director of the Lykes Bros. Steamship Company and the Tampa Inter-Ocean Steamship Company.

Mr. Lykes was one of the foremost leaders in Gulf shipping circles and known as a leader in the bulding of an adequate American merchant marine.

* * *

Not very long ago, Captain Hans Peter Lauritzen, 74, president of the Richmond Navigation and Improvement Company—the tug and barge concern—passed away in Richmond, following a heart attack. He had been identified with the development of Richmond Harbor for years, and was one of the best-known men engaged in Bay transportation activities. He was born in Denmark, but brought to California in 1869.

He is survived by his widow, Mrs. Marguerite Lauritzen, and his son, George B. Lauritzen.


BENJAMIN FRANKLIN
BENJAMIN FRANKLIN

Miss Dorothy Barnes, sponsor of the S. S. BENJAMIN FRANKLIN, *center, with her matron of honor, Mrs. Leon J. Manees of Long Beach, and S. D. Bechtel, president of the California Shipbuilding Corporation*

The Franklin pulls to a stop in Cerritos Channel with the two huge cables attached to her dragging 88 tons of chains in two wooden troughs partly filled with dirt on either side of the sliding way—a necessary precaution because of the narrowness of the channel

The Franklin is escorted by tugboats into the outfitting docks to join her sister ships, the John C. Fremont and the Thomas Paine, which are now being rushed to completion

Launched by CALSHIP

The S. S. Benjamin Franklin, third of fifty-five emergency cargo vessels scheduled for construction by the California Shipbuilding Corporation, was launched at high tide on the morning of November 16 from Shipway No. 3 of the Terminal Island yard.

Miss Dorothy Barnes, daughter of James E. Barnes, Washington, D. C., representative of Todd Shipyards, was the sponsor for the 427-foot freighter, built at an estimated cost of $1,650,000 for delivery to the United States Maritime Commission.

The first two vessels launched by the Terminal Island yard for the Maritime Commission's "Liberty Fleet" were the John C. Fremont and the Thomas Paine, waterborne on September 27 and October 26, respectively.

The Franklin joined her sister ships in the outfitting docks, where the Fremont and the Paine are being rushed to completion for their trial runs. The first ship has been designated for service with the American President Lines, the second with Lykes Brothers Steamship Company.

All the fourteen shipways of the 100-acre Calship yard are now occupied with hulls, the seventeenth keel being laid on Shipway No. 3 on November 17. Tentative plans had been made to launch the John Paul Jones on Shipway No. 4 sometime before December 1.

With its highly accelerated shipbuilding program gathering momentum day by day, Calship expects to be launching a ship a week by the first of the year. More than 13,000 employees are now working in this second largest emergency yard in the United States, construction of which started only last February.

OFFICE OF THE COMMANDANT
TWELFTH NAVAL DISTRICT
San Francisco, California

November 18, 1941

My dear Mr. DeRochie:

Your letter of November 14th and copy of the November issue of the PACIFIC MARINE REVIEW have been received.

I find this issue particularly interesting in view of the fact that I was privileged to attend many of the functions in connection with the Propeller Club convention in San Francisco.

My thanks to you for remembering me with this copy and my congratulations to you and your staff on a particularly fine issue of your valuable publication.

Sincerely yours,
J. W. GREENSLADE,
Rear Admiral, U. S. Navy

New TM for Port

Satisfaction is being expressed by local steamship men and others whose business is connected with the Port of San Francisco over the accomplishments to date by Robert K. Hunter, who is now one monh in his position as traffic manager for the Port of San Francisco.

Mr. Hunter assumed the newly created post on November 15, last, following his successful passing of a State Civil Service examination. He brought to his new duties a wide range of experience that called the attention of ship operators to his ability several years ago. When he was notified of his selection to his present post, Mr. Hunter was associated with the Luckenbach Steamship Company in San Francisco as Westbound Agent.

Born in Sacramento, Mr. Hunter entered transportation and traffic work with the Southern Pacific Company in San Francisco. Later he joined the Pacific Steamship Company and subsequently entered the employ of Sudden & Christenson. In 1925 he went with Luckenbach.

Not only traffic experience is credited to the new Harbor Board traffic manager, but a legal background: he was graduated from the law school of the University of San Francisco, and passed examinations qualifying him to practice before the Interstate Commerce Commission and the United States Maritime Commission.

Replacing Hunter in Luckenbach is William G. Sheldon, formerly district freight agent in Los Angeles and widely known in Pacific Coast steamship affairs.

* * *

Joins 25-Year Club

On November 6, **John R. Conover,** Superintendent, Marine Service Department, received Sperry Gyroscope Company's 25-year emblem from **Robert B. Lea,** vice president in charge of sales.

Mr. Conover served as an apprentice seaman on U. S. S. Hartford, Admiral Farragut's flagship) one of the last square riggers in the U. S. Navy. He later became an electrician, and was serving aboard the U. S. S. Delaware when the first Sperry Gyro-Compass in the Navy was installed on that vessel in 1911. After leaving the Navy in 1912, he worked in the electrical contracting business until he joined Sperry's Engineering Department in September, 1916. He was transferred to Marine Service in 1917, and after a year of extremely active and varied service work was well qualified for his next job, that of supervision of Gyro-Compass testing in the factory. He was so successful in making the then somewhat temperamental compasses behave that he was rewarded the following year by being made assistant service superintendent, and in 1924 became superintendent of the department.

Robert B. Lee of Sperry honors John R. Conover

Mr. Conover is a member of the Propeller Club, makes a hobby of raising chickens, and is a familiar figure in New York maritime circles.

* * *

De Luxe Filters

The De Luxe Products Corporation of La Porte, Indiana, announces the appointment of the Eugene V. Winter Co. of San Francisco as its distributors in the marine and industrial field for Central California.

De Luxe Products manufacture the De Luxe Filter which during the past eight years has been in use filtering petroleum or its distillates in thousands of internal combustion engines of all types.

This filter applies the absorption principle of filtration and is arranged to continuously take a certain proportion of the oil in the system, clean it from dirt, water, and contamination, and return it to the crank case.

Through the use of a pressure control valve built into the filter, and through a series of metered orifices, the pressure and volume of oil passing through the filter are controlled. This eliminates all channeling or packing of the cotton cartridge used and maintains the filtering element in good condition for long periods. The cartridge is easily removed and is inexpensively duplicated. Its untreated cotton element has no unfavorable reaction on compounded oils.

A large sump capacity is incorporated in the De Luxe filter, and this sump is designed to trap water and free carbon, thus eliminating the formation of sludge in the engine crank case. The line comprises a full range of capacities so that De Luxe filters are obtainable for all sizes of gasoline, natural gas, butane or diesel engines. These filters have been adopted as standard equipment by several engine manufacturers.

"Supervisor" Safety Spectacles

The Tulca Division of the Univis Lens Company, Dayton, Ohio, has added a new, rimless-type, safety spectacle to its eye protection line. The "Supervisor" spectacle is fitted with the company's special material (not glass), Tulca safety lenses. They come with or without side shields.

According to the manufacturer, these safety spectacles are as comfortable and as pleasing in appearance as regular eyeglasses because of the extremely light weight of the Tulca lenses. They were designed specifically for use by supervisors, checkers, inspectors, maintenance men, and by visitors who are exposed to eye hazards in plants, even though they are not actively engaged in operations where the wearing of goggles is mandatory.

One of the most important safety features of these Tulca lenses is the fact that they do not pit.

Women's Merchant Marine Organization Active

The Women's Organization for the American Merchant Marine, Inc., held their regular monthly meeting Wednesday, November 12, at the Hotel Astor.

Mrs. Fred A. Nichols presided as Acting President in the absence of Mrs. Benn Barber, who is now on the West Coast following her attendance at the Propeller Club Convention in San Francisco. Incidentally, Mrs. Barber expects to meet with groups of ladies in San Francisco and Los Angeles to help them organize branches of the Club in both of those cities.

Commander George E. McCabe, U. S. C. G., who is superintendent of the Maritime Training Station at Hoffman Island, was scheduled to speak, but, due to illness, sent to represent him, Lieutenant-Commander William J. Austermann, U. S. C. G., Executive Officer at the Maritime Training School, who described the training courses for apprenticed and unlicensed seamen as entirely voluntary and non-military, under the careful administration of the Coast Guard. The School, he said, was established as a result of a comprehensive survey conducted by the Maritime Commission in 1936 by direction of Mr. Joseph A. Kennedy, then Chairman of the Commission.

This survey showed the necessity of providing the American Merchant Marine with a continuous supply of trained young seamen to man the new mercantile fleet contemplated by the Maritime Commission as a result of Congressional action which authorized an extensive shipbuilding program.

As is customary at these meetings, Commander Austermann was asked many questions by the members of the Club at the conclusion of his interesting address, particularly as to the recreational facilities available for the young men under training. This appeared to open up a very interesting problem which will be further discussed at the next meeting of the Club.

As of this date, the Women's Organization has donated to the American Red Cross in Great Britain, 2 ambulances, 2 endowed hospital beds, and 1 field kitchen.

The officers of the Women's Organization are as follows: Mrs. Benn Barber, president; Mrs. Fred A. Nichols, first vice president; Mrs. Oscar Du Pont, second vice president; Mrs. Barnard Kelly, recording secretary; Mrs. Robert G. Allen, corresponding secretary; Mrs. George Hoeft, treasurer, and Mrs. Thomas Eagan, historian.

Meetings will be held at the Astor Hotel every second Tuesday of each month at 2 p. m., and all women interested in our work with maritime affiliations are urged to become members of the Organization and attend.

Mrs. Harry W. Parsons,
Chairman of Publicity

* * *

Port of Seattle

The Propeller Club of the Port of Seattle held its annual meeting at the Arctic Club late in October, and all of the previous year's officers were re-elected unopposed. Harrison J. Hart was retained as president, Philip M. Crawford as vice president, and A. D. Stewart as secretary-treasurer. Four were nominated for the Board of Governors: Captain W. H. Munter, E. G. Dobrin, M. D. Calder, and Robert L. Albin. The meeting was attended by Propeller Club members from all parts of the country returning from the annual convention at San Francisco.

* * *

B. & W. Transfer

Mr. W. J. Thomas, who has spent nine years with the Process Equipment Division of The Babcock & Wilcox Company at Barberton, Ohio, has now been transferred to the executive department of the sales offices of The Babcock & Wilcox Tube Company at Beaver Falls, Pa.

Prior to coming with The Babcock & Wilcox Company, Mr. Thomas was associated with the Petroleum Iron Works Company at Sharon, Pa., as assistant manager of sales.

Mr. Thomas is a graduate of Carnegie Institute of Technology, Class of 1922.

THE PROPELLER CLUB OF THE
UNITED STATES
NATIONAL HEADQUARTERS
17 Battery Place
New York, N. Y.

November 19, 1941

Mr. B. N. De Rochie, Chairman
Publicity Committee—Fifteenth Annual Convention
Pacific Marine Review
500 Sansome St.
San Francisco, Calif.

Dear Mr. De Rochie:

Now that the Fifteenth Annual Convention of the Propeller Club of the United States has passed into history, we want to again express to you the appreciation of the entire organization for the splendid accomplishments of your Committee toward the success of this important meeting.

The smoothness with which everything was handled, the attention to the many details which was so apparent, could only be the result of many hours of hard work on the part of those who gave so freely of their time and talents for the general welfare of the American Merchant Marine.

It is impossible to write to every individual who did his bit in the preparations for the Convention, so may I also ask you to extend the Association's thanks and good wishes to every member of your Committee and the other members of The Propeller Club, Port of San Francisco, who had a share in this important undertaking?

Yours for American Shipping,
Arthur M. Tode,
Honorary President

* * *

McCormick

Operating Manager Joseph A. Lunny announced changes in masters of two of the McCormick Steamship Company vessels now engaged in defense transportation out of Atlantic ports.

Captain Karl Moden went East to take command of the Hamlin F. McCormick. He was formerly Chief Officer on the steamer Diamond Cement. The Hamlin F. McCormick is running from New York to the Gulf.

Captain Gus Pettersen changed from the West Portal to the West Ira, changing commands with Captain O. P. Carson.

Problems Answered

(Continued from page 53)

would have contracted to the actual cold length.

To calculate a simple case, suppose the plates riveted are two two-inch pieces, total rivet length four inches. When solid, it cools from 600° to 100° F., a change of 500 degrees. If free to shrink, it would shrink a distance of:

Shrinkage $= .0000065 \times 4 \times 500 = .013$ inches. But not being free, it is stretched .013 inches.

The stress in the rivet which would stretch it .013 inches in a four-inch length is:

$$E = 30{,}000{,}000 = \frac{\text{Stress}}{.013 \div 4} = \frac{\text{Stress}}{.00325}$$

and stress $= 30{,}000{,}000 \times .00325 = 97{,}500$ lbs. per sq. in. Thus, rivets must be made of the very best steel, and even then sometimes break if improperly driven. This figure is reduced materially by the fact the plates heat up and expand while the rivet is being set, and cool off *with* the rivet. To accurately calculate this, we would need to know the temperature to which the plates heated up. Furthermore, the plates give a little under the tremendous squeezing effect of the rivet. If there were no squeezing or heating of the plates, the rivets would snap off as fast as they cool, as this figure is about the breaking stress of most steels.

These principles can well be adapted to large bolts in coupling flanges or turbine casings.

Turbine Flange Bolting by Heating and Calculations

Management and procedure of bolting and unbolting the joints of turbines is worthy of consideration. The joint is a smooth surface straight to a true plane spotted in with a surface plate. When pulled up tight it should be steam tight without the necessity of any gaskets or compounds. On larger turbines, particularly the higher pressure and temperature units, it is unnecessary to use any kind of gasket compound or material in the joints. On smaller units, it is usually customary to paint the joint with some heat-resisting compound to fill up the small microscopic openings in the surface. Bolting must necessarily be brought up so that it is a great deal tighter than would be necessary to support the lifting effect of the pressure in the shell. This means a heavy pre-load on the bolts. Flange design is such as to bring the bolts as close to the center line of the turbine as is possible without allowing them to actually enter the casing. This is accomplished by making the bolts very long and the flanges very thick. In other words, the flange width can extend out from the center line as far as is reasonable from the bolt giving the bolt a leverage to close the joint at the inside edge.

It is good practice to stretch the bolts 1 mil per in. of length. Using a thermal coefficient of expansion of .0000065, a simple calculation shows that approximately 175° of temperature difference in cooling would give this bolt stretch. On large turbines it is quite common practice to drill a ⅝-in. or ¾-in. hole through the center of the bolt through which a flame from a torch can be directed to bring the temperature of the bolt up while it is in place on the turbine. Before applying the heat, the nut is brought up a little better than hand tight and then heat is applied until the bolt head at the bottom has dropped down one mil per in. of flange thickness so that if we had a flange of 20 in., heat would be applied to give a 20-mil gap between the head and the flange. Then, while the bolt is hot, the nut is brought up a little bit better than hand tight with a wrench and the job is completed.

As a matter of interest, 100° change in temperature will give a stretch of about 7 mil per foot. Assuming Youngs' Modulus of 30,000,000, each degree change of temperature gives a pre-load of approximately 95 lb. per sq. in. in the bolt. For 1 mil per in. stretch and temperature change of 175° F., this gives a pre-load stress of 16,600 lb. per sq. in. in the bolt. This, of course, will be reduced somewhat by compression of the flange and any give that might occur in the joint. It is usually a good idea to pull down every third bolt with a wrench to remove any possibility of further give in the joint before preloading the bolts.

All of this would indicate that the bolts for a steam turbine must be made of the very best possible steel looking towards a high tensile strength, but more particularly towards a minimum of creep or permanent stretch with high temperatures. It has been found that these two requirements are not consistent with each other, and that by sacrificing somewhat on cold tensile strength, it is possible to improve materially the hot creep effect. In other words, better characteristics are obtained at high temperatures. The heat treatment for this condition is special and becomes an important part of turbine design.

Bolts which have been set up for a year or so, particularly near the high temperature end of the turbine, usually will be found to be very difficult to start, removal of the nuts requiring some sledging on a short wrench. It is not at all infrequent to find them impossible to move, making it necessary to burn the nut off with a torch. This can be done without spoiling the bolt.

This brings up the desirability of a preparation on the threads of the bolt when it is first put together to prevent the rusting together of nut and bolt later on. It is good practice to apply a mixture of flaked graphite and water to the threads before putting the nut in place. The water is considered to be better than a light or heavy oil owing to the fact that the oil later on carbonizes to a flint-like carbon materially reducing the value of the graphite.

A simple calculation shows the impracticability of using wrenches to preload the bolts on very large turbines. Probably the 2½-in. bolt size is as large as can be properly tightened up with a wrench. Assuming 13 threads and an efficiency factor of 25 per cent, it is possible to apply a 15,000 lb. per square inch stress in the bolt by applying 100 lb. of force at the end of a 3-ft. wrench. Larger bolts have a larger cross-sectional area and usually have fewer threads per inch, so that with a wrench it might be difficult to get as much as 5000 or 7000 lb. per sq. in. stress on the steel, which, of course, is not adequate.

"KNOW-HOW" is bred of experience

Here in the heart of New England, the spirit of the guilds lives on. Here are men who take deep pride in the skill of their hands. They are the true craftsmen whose "know-how" is bred in the experience of generations . . . learned from father by son. These men set for themselves a standard far higher than others set for them and build into a product their own strength and soundness.

Such craftsmen have built Hyde machinery for almost a century. They have created for Hyde its unexcelled record for serving the marine industry faithfully and well. They are ready and able to serve you today.

HYDE WINDLASS COMPANY, BATH, MAINE

West Coast Representative:
Thomas A. Short, 575 Howard Street, San Francisco

IT IS HYDE'S PRIVILEGE TO SUPPLY DECK MACHINERY FOR:

Bethlehem Steel Co. (Shipbuilding Division) Fore River Plant	Newport News Shipbuilding and Dry Dock Co.	Federal Shipbuilding and Dry Dock Co.
U.S.S. SAN DIEGO U.S.S. SAN JUAN	U.S.S. INDIANA U.S.S. HORNET	U.S.S. ATLANTA U.S.S. JUNEAU

HYDE
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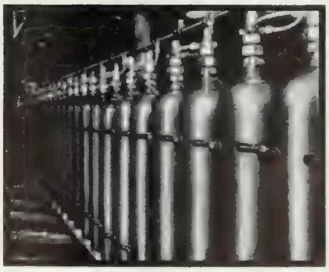
U. S. ARMY TRANSPORT, ST. MIHIEL

Safety on the seas means more than escort and depth bombs, particularly when transporting troops and equipment. Fire is an ever present hazard. That's why U. S. Army Transports like the *St. Mihiel* are protected against fire with C-O-TWO*.

IT'S SAFER *because* IT'S FASTER

This phenomenal fire protection—non-damaging, carbon dioxide gas—is as quick as the wind. It kills fire in the bilge, engine space, paint locker, radio or electric equipment in split seconds. C-O-TWO is ideal for cargo spaces and a combined C-O-TWO smoke detecting and fire extinguishing systems, with portable or hose unit, gives any boat maximum fire protection. Equipment for every size boat. Write for information.



C-O-TWO MARINE INSTALLATION
Wm.F Kenny, 185 Ft. Barge, C-O-TWO Protected 30 Cylinder Installation

C-O-TWO is a registered trademark. To be safe, specify C-O-TWO and this company's name when ordering.*

C-O-TWO FIRE EQUIPMENT CO.
10 EMPIRE STREET, NEWARK, NEW JERSEY
Sales and Service in the Principal Cities of United States and Canada

Keep Posted!

Recent Development in Ship, Yard and Dock Equipment

Calrod Resistors Speed Up Testing

While searching for a special loading resistor to be used in testing diesel-electric sets for submarines, engineers of a large diesel engine company recently evolved a novel application of General Electric Calrod heaters.

The requirements called for a resistor that could be operated continuously at varying loads and voltages over long periods with few shut-downs. Continued shut-downs would require the tests to be started over at considerable cost. Another requirement was light weight, as the resistors were to be located between the roof trusses, throwing all the weight on the roof.

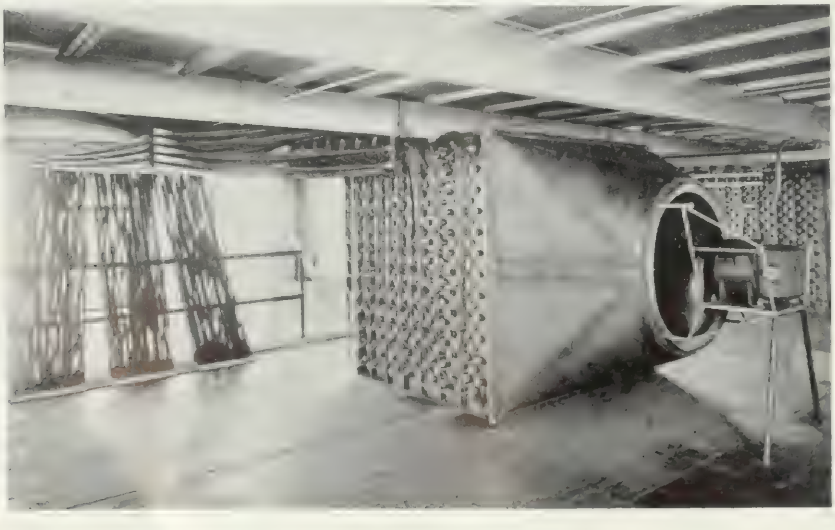
Fin Calrod heaters were selected for this job. Two hundred and forty of these 7-kw, 110-volt heaters comprise one resistor. This company now has four of these resistors installed, each mounted across a six-foot square duct. A motor-driven fan blows 21,000 cubic feet of air per minute through each resistor to dissipate the heat. Hot air is blown outdoors.

The fin Calrod construction of the heaters is such that the fin is permanently bonded to the resistor casing by electric furnace brazing. This provides positive heat transfer to the fin, allowing operation at temperatures as high as 1000° F.

At each end of the resistor, a threaded bushing, slightly larger in diameter than the fin section, facilitates installation. If it becomes necessary to remove a single heater, it can be done by removing the terminal connections and nuts from one of these bushings.

Each row of heaters is supported in the middle by a pipe running lengthwise in the duct. At each end of the heaters, the terminals are sealed with Mycalex. This construction provides a large terminal for wiring, and permits the terminals and wiring to be outside the duct, away from the heat.

Both terminal sides of the duct are insulated with three inches of plastic insulation. This keeps heat away from the cable and also reduces heat dissipated into the roof of the building.



Calrod heater resistors used in testing by large diesel engine company

New Arc Welder For Aircraft Welding

A new 150-ampere, direct-current arc welder, the Strikeasy, has been announced by the General Electric Company for use in fabricating bright-surfaced, thin-gage metals, such as aircraft tubing (SAE-4130) which has a wall thickness of 35 mils. Based on extensive research and experience, the design and characteristics of the new welder have been especially developed to help operators produce strong, uniform joints quickly and easily without spoilage.

Chief among the important features of the Strikeasy arc welder is its "pep" or extra high instantaneous recovery of voltage (40 to 60 volts), which helps the operator to strike the arc with ease under the difficulties presented by thin metals having a bright, polished surface. Rapid, accurate adjustment of the welding current is also provided by means of a tap switch and a rheostat; the former for speed in getting wide range adjustments, and the latter for accuracy in obtaining the exact number of amperes needed for best results. The wide welding range permits the use of shielded-arc electrodes as large as $\frac{3}{16}$ inch in diameter and as small as $\frac{3}{64}$ inch in diameter.

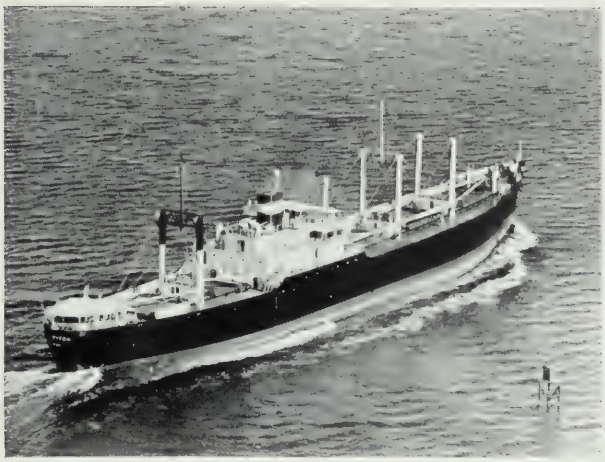
As a further aid to the operator in producing welds of uniform strength, the Strikeasy arc welder may be used with a remote-control device for reducing the current when the operator wants to fill a weld crater or when a reduction of heat is needed to avoid burn-through.

The equipment is horizontally mounted to assure efficient lubrication, and to avoid excessive end thrust on its self-sealed ball-bearings. Cool operation is obtaind by means of a fan cooling system, while isothermic re-

DEPENDABLE POWER

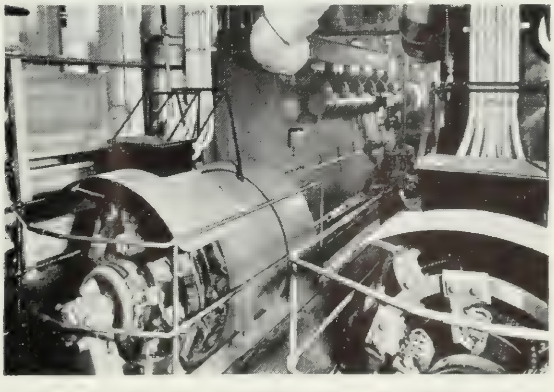
★ ★ ★ ★ FOR ★ ★ ★ ★

AMERICA'S MERCHANT MARINE



SEA WITCH—Maritime Commission Type C-2 Cargo Motorship which has proven its value in helping to make America's Merchant Marine second to none.

FOR many months, the Sea Witch, C-2 Cargo Ship of the Maritime Commission, has traveled the high seas bearing cargoes of vital raw materials for American Industry. The faithful performance of the two Superior Diesel Generator Sets illustrated below in supplying the vital electric power used for all purposes both under way and in port is indeed noteworthy. In April, 1940, we said in Motorship, "Only dependable Diesels should go to sea in big ships." Today Superior's dependability in this all-important service is a matter of record.



Two 6-cylinder, 450 H. P. Superior Diesel Marine Generators which furnish all auxiliary power for the SEA WITCH.

THE NATIONAL SUPPLY COMPANY

SUPERIOR ENGINE DIVISION

FACTORIES: Springfield, Ohio; Philadelphia, Penna.

SALES OFFICES: Springfield, Ohio; Philadelphia, Pa.; New York, N. Y.; Los Angeles, Cal.; Jacksonville, Fla.; Houston, Texas; St. Louis, Mo.; Fort Worth, Texas; Tulsa, Okla.; Boston, Mass.

KELVIN-WHITE

NAVIGATING EQUIPMENT

has been installed on a great many new vessels of the

PANAMA LINE
AMERICAN EXPORT LINE
ROBIN LINE
MISSISSIPPI S. S. CO.
SOCONY-VACUUM
SINCLAIR OIL CO.
TEXAS CO.
UNION OIL CO.
RICHFIELD OIL CO.
and many others.

* * *

We are now engaged in fitting out ships for the British, and the Lease-Lend fleet now building throughout the United States.

* * *

Our equipment is in general use in the U. S. Coast Guard; U. S. Lighthouse Service; U. S. Army; U. S. Engineers; and in many vessels in the U. S. Navy.

* * *

We build our own equipment and design it for the particular job. Designs, specifications and general information gladly furnished.

KELVIN-WHITE CO.

90 STATE STREET, BOSTON

Represented on the Pacific Coast by

Capt. Frank Jansen, 1361 South Flower Street, Los Angeles
George E. Butler Co., 356 California Street, San Francisco
Nuttall-Styris Co., 825 Columbia St., San Diego, Calif.
Max Kuner Company, 812 First Avenue, Seattle
Pacific Marine Supply Company, Seattle

* * *

Ship-to-Shore Radiophones . . . Radio Direction Finders . . . Compasses . . . Binnacles . . . Logs . . . Bludworth Direction Finders . . . Photo-electric Pilot Automatic Steerers . . . Charts . . . Sextants . . . Thermotank Punkah Louvres for modern ventilation . . . Everything for navigation.

lays guard against operation on harmful overloads.

Compact and easy to handle, the Strikeasy arc welder is available with or without running gear. Without running gear, the overall dimensions are: length, 28 in., width 13½ in., and height 21 in.; net weight 385 lb. With running gear overall dimensions are: length, 40 in., width, 16 in., and height, 27 in.; weight, 415 lb. net.

The General Electric Company's Arc Welding Division is represented on the Pacific Coast by the Victor Equipment Company, with headquarter offices at 844 Folsom Street, San Francisco, and J. E. Haseltine & Company, with headquarters at 2nd Avenue and Ash Street, Portland, Oregon.

Westinghouse research engineer, F. C. Rushing, and new vibration pick-up

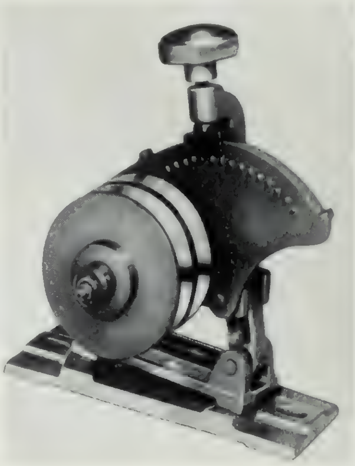
Low-Speed Machines Balanced on Own Pedestals

Low-speed machines, such as waterwheels and diesel-driven generators rotating at as low as 100 rpm, may now be dynamically balanced on their own pedestals. This extension of the balancing range from the previous limit of 600 rpm has been made possible by means of a new pick-up, developed by Westinghouse engineers, which indicates vibrations of double amplitude as low as 0.003 inch at 100 rpm, the lower limit of its field of use. The newly-developed pick-up is used with a standard portable balancing unit and conventional sine-wave generator.

To balance rotating machines in their own mounting, and under operating conditions, it is customary to resort to a scheme in which a wattmeter is used to measure both the magnitude and the phase angle of the vibrations caused by unbalance in the rotor. A pick-up held against the frame of the machine translates the vibrations into voltages that are impressed on the potential coil of the wattmeter. The current coil is energized from a sine-wave generator coupled to the rotor being balanced. The phase angle between the current and the voltage in the wattmeter can be made to equal 90 degrees and its indication made to equal zero by rotating the stator of the sine-wave generator. This position is a measure of the phase angle of the unbalance vibration. Shifting the phase of the generator 90 degrees from this zero position gives a maximum reading in the wattmeter. This reading is a measure of the amplitude of the vibrations. With the magnitude and phase angle of the unbalance vibration known, it is relatively easy to compute the proper balancing weights.

The difficulty with low-speed balancing has been that a pick-up capable of measuring vibrations of low frequencies must have much lower natural frequencies than the vibrations measured. To furnish correct indication, a vibration pick-up and its mounting should have a natural frequency of no more than one-half the frequency of vibration of the machine to be balanced. Thus for a 100-rpm generator, for example, the natural frequency of the pick-up must be not more than 50 cycles per minute. To get a body with such a low frequency has heretofore meant the use of large masses, making the instrument unwieldy.

The new pick-up employs something like an inverted pendulum. The frequency of an ordinary pendulum, operated by gravity, can be lowered by lengthening its arm—the way a grandfather's clock is regulated. Similarly, the natural frequency of an inverted pendulum can be made extremely low by weakening the restoring springs so that it is barely stable in a vertical position. To permit the use of this pick-up in all directions, the effect of gravity has been eliminated by laying the pendulum on its side, and the force previously supplied by gravity is furnished by a toggle-like spring mechanism attached to the pendulum.



A New Variable Speed Control

A new V belt variable speed transmission, known as the JFS-Cub, is being introduced to industry by Standard Transmission Equipment Company, Los Angeles, California.

The JFS-Cub, the newest addition to the line of V belt speed controls manufactured by the company, is especially designed for all "A" section V belt applications and for speed ranges up to 3.3-1. Smooth sided pulleys are used rather than the interlocking type. Among the advantages claimed are: the patented positive belt alignment feature which makes possible the mounting of the Cub in any and every position without impairing function or throwing belts out of alignment; machined and balanced cast iron construction, forced lubrication of the special bronze bearings on which the pulleys rotate; free-end pulley spindle to permit easy installation of belts; both pulleys on one side of pivotal mechanism which permits motor pulley and driven pulley to be almost directly in line with each other, etc.

The JFS-Cub is being introduced as a low cost speed control to make possible application on machines that never before could have the advantages of infinite speed selection because of expense. The Cub will transmit full capacity of "A" section V belts.

TODD-CALIFORNIA SHIPBUILDING
CORPORATION
Richmond, California
November 6, 1941

Pacific Marine Review
500 Sansome Street
San Francisco, California
Att'n: Mr. Bernard De Rochie

Gentlemen:

Thanks kindly for the courtesy extended to me in forwarding copy of your October edition of the Pacific Marine Review.

At this date I have hardly had time to peruse it as thoroughly as I would like, but hope to in the very near future. You have many features in this edition that are of great interest to the shipyard worker.

Again, my appreciation for your kindness.

Yours very truly,
TODD-CALIFORNIA SHIPBUILDING
CORPORATION,
L. R. Manis,
Purchasing Agent

◆

The Foreign Trade Association of the San Francisco Chamber of Commerce, at its regular meeting, December 1, at the Mark Hopkins Hotel, paid tribute to one of its members, Arthur B. Poole, in connection with his recent election to the presidency of the Propeller Club, Port of San Francisco

Barge Authority Passes

Mr. John L. Taylor, contracting manager of the Barge Department, American Bridge Company, died October 24, 1941, in the Presbyterian Hospital, Pittsburgh, Pa., after an illness of several months. Mr. Taylor was born in Three Rivers, Mich., July 28, 1877.

Mr. Taylor was an outstanding authority on the design and construction of steel barges of all types for use in inland waterways and harbors. He designed and supervised the construction of the first all-welded steel barge, and pioneered in a large number of improvements and special features of barge construction which today are accepted as standards for their respective kinds of service. During World War I, he conceived the idea and, by his efforts and ingenuity, effected the methods used for prefabricating ship steel at inland plants for final and complete assembly at various shipyards.

Mr. Taylor began his service with the old Keystone Bridge Company in June, 1898. From 1899 to 1904, he was at the old Youngstown Bridge Company Plant. Both of these plants became a part of the American Bridge Company in May, 1900. From 1904 to 1906, he worked at the Ambridge Plant and was then transferred to the Pittsburgh Division Engineering Department. Here he was made Engineer of the Barge Division, and in May, 1924, was appointed contracting manager of the Barge Department. At the time of his death, Mr. Taylor had a continuous service record of 43 years with the American Bridge Company.

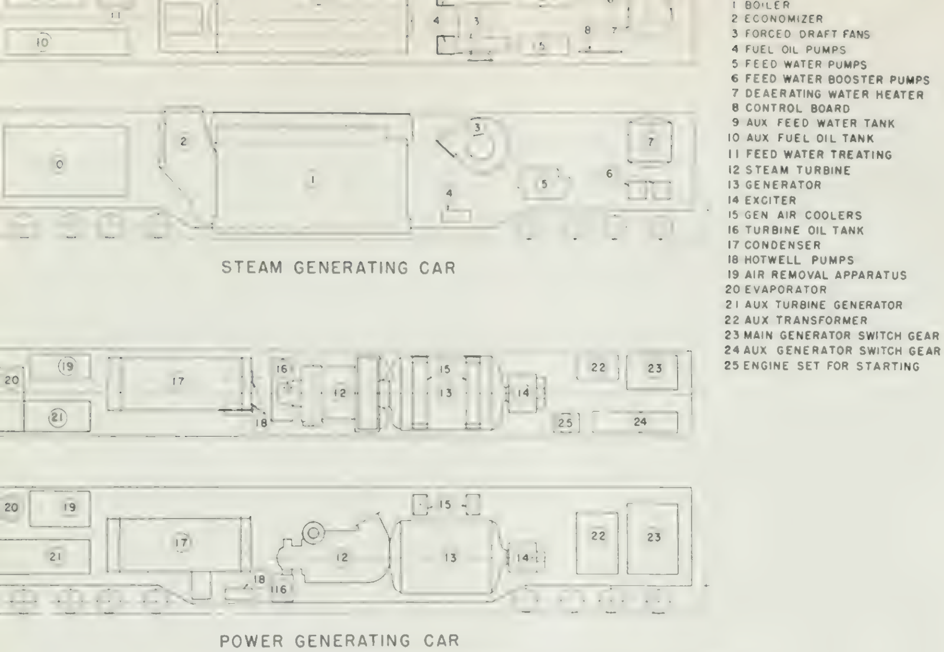
Mr. Taylor was a member of the Society of Naval Architects and Marine Engineers, and a charter member and a director of the Propeller Club of the United States, Port of Pittsburgh.

COEN DUPLEX OIL STRAINERS

Have given 100% satisfactory service for over 25 years in hundreds of marine installations

COEN COMPANY, INCORPORATED

SAN FRANCISCO *Combustion Engineers* NEW YORK



Plans and elevations of mobile power plant

U. S. Navy Mobile Power Plants

The Bureau of Yards and Docks, Navy Department, has ordered two 10,000-kilowatt, mobile, steam-electric power plants mounted on special railway cars from the General Electric Company to supply emergency power wherever its projects may require. The Bureau will locate one unit centrally on the West Coast and the other on the East Coast.

The "mobile" power plants will be the first of their kind to be built, but the turbine generators, boilers, and electrical equipment used in them will be apparatus of the types proved in service in regular central station and industrial installations.

Each of the units will be housed in two specially built railway cars, which can be hauled over the rails at speeds up to 40 miles per hour.

The power-generating car will contain a 10,000-kilowatt turbine-generator and its accessories, a condenser, and the necessary switchgear. The boiler and its auxiliaries, along with a starting engine generating set, will be housed in the second car. A mobile substation, constructed on a standard car, will be used in conjunction with each generating unit to permit proper voltage to be obtained for any Naval shore establishment.

General Electric engineers estimate that the mobile power plants can be put "on the line" within 24 hours after they are shunted into a siding.

Bunker C fuel oil will be used to fire the boilers, and each unit will consume about three tank cars a day when operating at full load. A sufficient fuel supply for two hours' operation will be carried in the boiler cars of each of the units, however, so that they can generate power before the tank cars are hauled up and connected.

The two specially designed cars of each unit will be duplicates. They will embody fabricated welded-steel girder construction of the drop-frame type. The total weight (about 200 tons) of each car will be carried on eight axles, thereby obtaining an axle loading within the limits of good railroad practice.

The natural circulation type boiler for each unit will furnish 140,000 lb. of steam per hour. The turbines will be of single-cylinder design. They will be designed for 550-lb. steam at 825° F.

The generators operating at 3600 rpm will produce 60-cycle 3-phase power at 13,800 volts. They will be forced air cooled.

Dry Rot Preventive

The term "dry rot" is a misnomer; it is neither dry (because it flourishes under moist conditions), nor rot (because it is actually a fungus which breaks down the fibers of wood). Every yachtsman who has ever bought a used boat knows the ravages which dry rot can cause, and tests planking and interior parts by probing with a stout pocket-knife or awl.

While little can be done to arrest the progress of dry rot in already existing boats—except the costly replacement of the affected parts—a great deal can be done toward preventing it during the construction of new boats, by treating every piece of planking, or framing, with Permodip, new to the marine field, yet long and successfully used in the wood manufacturing industry.

The recommended method of treatment is dipping in Permodip solution for three minutes. After four hours drying, the parts are ready for installation in the hull. Large construction members, such as keel, stringers, clamps, etc., should be treated by spraying. This solution has no effect on finish coats of paint or varnish; it is, in fact, an excellent primer.

Moisture-control is very important to boat builders who employ the modern method of straight-line assembly, in which most of the construction-members are pre-shaped to templates instead of being worked out individually by hand.

New Water Pump Seal

In announcing a new Bellows-type seal, the Crane Packing Company, manufacturers of "John Crane" seals for more than a quarter century, list the following as principal features:

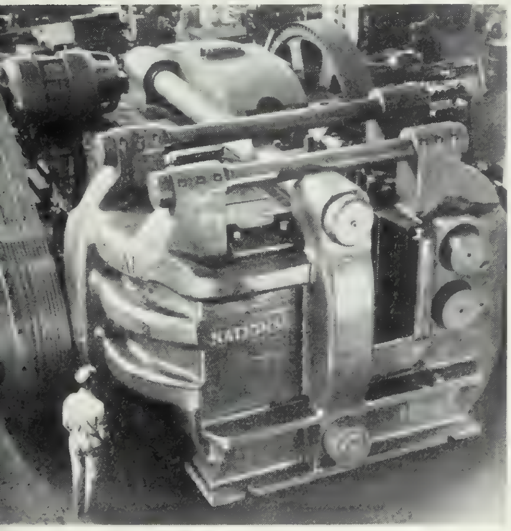
1. Seal has only 2 parts—bellows and spring. Bellows is an exclusive synthetic rubber compound, found to be superior to any other for sealing services; grease, oils, salt water, alcohols and anti-freeze do not affect it.
2. Installed partially compressed, ready for instant seal.
3. Entire unit (bellows and spring) is spring driven and operates as a driving coupling. Seal does not touch or have a sliding contact with the shaft; rust, corrosion and deposit do not interfere with or reduce efficiency.
4. Bellows connects two flanged

ends. Spring is placed in a fixed position against the inside shoulders of the flanged ends and so holds the contact facings against the sealing washer on the one end, and the driving base on the other.

5. Because of the seal's ability to flex and compress as a unit, pressure variation, misalignment, fan thrust, torque or vibration set up by an unbalanced impeller are automatically accommodated or compensated for.

6. The serrated contact facings are responsible for the positive seal at both the washer and driving base points. These facings are formed in a series of concentric grooves and flat-faced ribs, effecting seal with a suction-action.

7. Among other advantages is "blind-fold" installation. Seal cannot be installed wrong either on the assembly line or in the field. Both ends are identical—either end is right.



World's Largest Forging Machine

Widespread attention is being focused on the current delivery of the world's largest forging machines, one in November, and the other in February, to Tube-Turns, Incorporated, manufacturers of Tube-Turn welding fittings, at Louisville, Kentucky, by the National Machinery Co.

These mammoth forges represent a far-reaching development in the scope and capacity of forging operations. They will be put to work immediately in the production of airplane motor cylinder forgings and other vital armament needs.

Each machine weighs over 500,000 pounds, and required well over a year to build. One of the most significant features is the extreme compactness.

This unique compact design insures the exacting accuracy, precision and speed in the forging work for which these machines will be used.

Short, compact design is possible because the flywheel shaft is mounted in the neutral axis in the bed frame, and the over-arm heading slide permits locating the main shaft further forward without sacrifice in tool alignment. As a result, all of the bed frame weight is effective in providing that degree of rigidity which insures freedom from "spring."

The conditions to be met call for speed as well as accuracy.

The heading and gripping slides are of the over-arm suspended bearing type, and wedge adjustments are provided at the sides of both of these slides in order that a high degree of accuracy and alignment may be obtained.

Enormous longitudinal and cross-tie bars are provided, and these are made round in order to interfere to a minimum with die setting or adjustment.

The special tandem, by-pass automatic grip relief plus a friction-slip flywheel, protect these machines against accident.

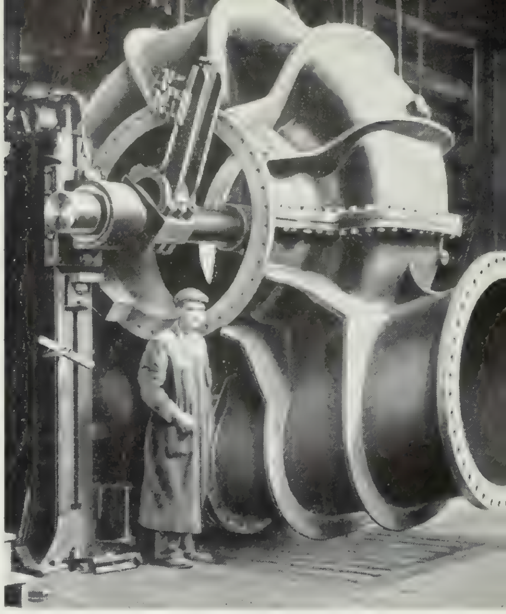
A new type of air-cooled friction clutch starts the machines instantly, and at high speed.

Finger-tip action, positive control with complete safety, enables the operator to obtain the highest output with the least manual effort.

The clutch is of enormous size. The air is applied directly at the center of the large oversize plates. The plates are self-aligning and the clutch is not required to serve the double purpose of a driving means and a friction relief on the heading movement. Ease and convenience of control, speed of operation and trouble-free performance are assured.

Huge Drydock Pumps

One of the largest pumping plants ever built is now being installed at the U. S. Navy drydock at Pearl Harbor, Hawaii. This project is of special interest because of its importance in the Naval Defense Program.



Large pump for U. S. Navy dry dock at Pearl Harbor

The four main 54-inch pumps each have a capacity of 130,000 gallons per minute against a total dynamic head of 20 feet. They are of the vertical shaft type, and are set in the dock approximately sixty feet underground. These pumps are to operate at 277 rpm, are each driven by a 1250-hp motor.

In addition to the four main pumps, the following pumping equipment is also being installed at the drydock:

Two 12-inch auxiliary drainage pumps, driven by 250-hp, 900-rpm electric motors, and each having a capacity of 7200 gpm against an 88-feet total head.

One eight-inch auxiliary drainage pump, driven by a 75-hp, 1200-rpm electric motor, and having a capacity of 3000 gpm against a 60 feet total head.

Two three-inch sump pumps, driven by 10-hp, 1800 rpm electric motors, and each having a capacity of 200 gpm against a 75 feet total head.

Two four-inch sewage pumps driven by 25-hp, 1200-rpm electric motors, and each having a capacity of 400 gpm against a 75 feet total head.

One four-inch sewage pump, driven by a 15-hp, 1200-rpm electric motor, and having a capacity of 300 gpm against a 50 feet total head.

All of the pumps for this noteworthy plant were furnished by Morris Machine Works of Baldwinsville, N. Y., which has also supplied considerable pumping equipment on other Government projects.

PROGRESS IN *American Shipyards*

★ **Asterisk indicates new listings.**

Pacific Coast

ALBINA ENGINE & MACHINE WORKS, INC.
Portland, Oregon

New Construction:

Hulls Nos. 51-59, nine 165′ steel submarine chasers for U. S. Navy. **Four keels laid up to December, 1941.**

ANDERSON & CHRISTOFANI
San Francisco, Calif.

New Construction:

Six 97′ AMC coastal mine sweepers for U. S. Navy.

One 48′ yacht for Herman Hogrefe. **Completed.**

One 60′ purse seiner for S. Piazza.

ASSOCIATED SHIPBUILDERS
Seattle, Wash.

New Construction:

One insulated self-propelled lighter for delivery to U. S. Navy at Puget Sound Navy Yard.

Four small seaplane tenders for delivery to Puget Sound Navy Yard.

Six wooden mine sweepers for delivery to U. S. Navy at Puget Sound Navy Yard.

ASTORIA MARINE CONSTRUCTION CO.
Astoria, Ore.

New Construction:

Four 135′ wooden diesel-powered mine sweepers for U. S. Navy. Delivery in 14 months.

BASALT ROCK CO., INC.
Shipbuilding Yard—Napa, Calif.

New Construction:

Hulls Nos. 22-23, two 10,000-bbl. fuel oil tankers, for delivery to Mare Island Navy Yard. 235′ x 37′ x 19′3″; 1000-hp diesel electric; cost $1,800,000. Contract awarded by Navy Dept., Bureau of S. & A., Washington, D. C. Keel laying dates, No. 22, June 20, 1941; No. 23, August, 1941. **Launching dates,** No. 22, October, 1941; **No. 23, December, 1941.** Delivery dates, No. 22, January 30; No. 23, May 30, 1942.

Hull No. 28, self-propelled lighter for U. S. Navy. 132′6″ x 30′ x 12′4″; 300-hp diesel; 500 gross tons; cost $370,000. Delivery date, February 15, 1942.

BERKELEY STEEL CONSTRUCTION CO.
Berkeley, California

New Construction:

One all-welded utility diesel-electric stern wheeler for U. S. Engineers. 102′ x 26′ x 5′. Cost $114,800.

BELLINGHAM MARINE RAILWAY & BOATBUILDING COMPANY
Bellingham, Wash.

New Construction:

Hulls Nos. 17-20, four mine sweepers for the U. S. Navy. Keel laying dates, No. 71, July 16; No. 18, July 22; No. 19, July 26; No. 29, July 31, 1941.

BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Division—San Francisco Yard
San Francisco, Calif.

New Construction:

Hulls Nos. 5366-5367, two 1650-ton destroyers, DD459-DD460, for U. S. Navy. Keels laid January 13, 1941. Launching date, No. 5366, October 30, 1941.

Hulls Nos. 5368-5383, sixteen 2100-ton destroyers, DD526-DD541. Keel laid, No. 5368, October 30, 1941.

Hulls Nos. 5390-5396, seven 1620-ton destroyers, DD605 - DD611. Keel laying dates, Nos. 5390, 5391, March 25 and 28, 1941.

Hulls Nos. 5386-5389, four 6000-ton cruisers, CL95-CL98. Keel laying dates, No. 5386, July 13; No. 5387, August 1, 1941.

BETHLEHEM STEEL COMPANY, INC.
Shipbuilding Division—San Pedro, Calif.

New Construction:

Hulls Nos. 9001-9004, four 2100-ton destroyers, DD544-DD547.

Hulls Nos. 9007-9012, six 1620-ton destroyers, DD612-DD617. Keel laying dates, Nos. 9007, 9008, May 1, 1941; Nos. 9009, 9010, May 29, 1941.

BIRCHFIELD BOILER CO., INC.
Tacoma, Washington

New Construction:

One U. S. Coast Guard Cutter for Columbia River and Snake River.

N. J. BLANCHARD BOAT CO.
Seattle, Washington

New Construction:

One sloop, 52′ x 11½′, 50-hp gas engine.

Three 45′ aircraft tenders or rescue boats for the U. S. Navy.

CALIFORNIA SHIPBUILDING CORP.
Wilmington, California

New Construction:

Hulls Nos. 1-55, fifty-five EC-2 type cargo vessels for U. S. Maritime Commission. Fourteen keels laid up to October 14, 1941. **Launching dates,** No. 1, September 27; No. 2, October 26; **No. 3, November 16, 1941.**

CAMPBELL MACHINE CO.
San Diego, Calif.

New Construction:

Hull No. 69, 450-ton fishing boat for A. Tavaras & Co., 110′x26′x12′; 350-hp Union diesel. Cost $170,000. Keel laid June 1, 1941. Launching date, October 25, 1941.

Hull No. 70, 550-ton fishing boat for G. Vattuone & Co. 128′x12′ 6″; 500-hp Union diesel. Cost $210,000. Keel laid June 15, 1941. **Launching date, December 15, 1941.**

COLBERG BOAT WORKS
Stockton, Calif.

New Construction:

Three large wooden mine sweepers for U. S. Navy.

★ **One 39′ 6″ L. O. A. survey inspection boat** for U. S. Army Corps of Engineers.

COMMERCIAL IRON WORKS
Portland, Ore.

New Construction:

Four anti-submarine net tenders. Completed September, 1941.

Seven steel mine sweepers for U. S. Navy.

Four fleet tugs for U. S. Navy.

Four steel submarine chasers for U. S. Navy.

CONSOLIDATED STEEL CORP., LTD.
Los Angeles, Calif.

New Construction:

Hulls Nos. 157, Aguiprince; 158, Alcoa Pennant; 159, Alcoa Polaris; 222-251, 33 C-1-BT, full scantling, turbine propulsion cargo vessels for U. S. Maritime Commission. **Keel laying dates,** No. 159, April 7; No. 222, November 20; No. 223, November 25; **No. 224, December 20; No. 225, December 29, 1941.** Launching dates, No. 157, March 27; No. 158, June 26; No. 159, September 27, 1941; No. 222, March 30; No. 223, April 17; No. 224, May 4; No. 225, May 22, 1942. **Delivery dates, No. 157, November 10; No. 158, December 8, 1941;** No. 159, January 15, 1942.

Hulls Nos. 206, U. S. S. Doyen; 207, U. S. S. Feland; two design P1-S2-L2 twin-screw turbine propulsion transports for the U. S. Maritime Commission. **Keel laying dates,** No. 206, September 18; **No. 207, November 10, 1941.** Launching dates, No. 206, February 18; No. 207, June 17, 1942. Delivery dates, No. 206, June 29; No. 207, October 26, 1942.

FELLOWS & STEWART, INC.
Wilmington, California

New Construction:

One 100′ V-bottomed kelp harvester. Delivered.

Two 45′ taxi boats. Delivered.

Six landing floats for California Shipbuilding Co., Terminal Island. Two, 25′x65′; one 25′x60′; three 12′x60′. **Delivered.**

F. L. FULTON
Antioch, Calif.

New Construction:

Six 97′ wooden mine sweepers for U. S. Navy.

GEN. ENGINEERING & DRY DOCK CO.
Alameda, Calif.

New Construction:

One anti-submarine net tender for U. S. Navy.

Eight mine sweepers for U. S. Navy.

HARBOR BOAT BUILDING CO.
Terminal Island, Calif.

New Construction:

Four 60-foot U. S. Navy target boats. Completed.

Hulls Nos. 117-120, four 136′ motor mine sweepers for U. S. Navy. Keels laid, No. 117, May 8, 1941; No. 118, May 12, 1941; No. 119, July 15, 1941; No. 120, August 23, 1941. Launched No. 117, August 23; No. 118, October 27, 1941.

HUBBARD'S SOUTH COAST COMPANY
Newport Beach, California

New Construction:

Four 45′ twin-screw aircraft tenders for U. S. Navy.

Six 135′ mine sweepers for U. S. Navy.

KRUSE & BANKS SHIPBUILDING CO., INC.
North Bend, Oregon

New Construction:

Hulls Nos. 121-124, four 135′ wooden mine sweepers, YMS type, for U. S. Navy. Cost $1,800,000.

LAKE WASHINGTON SHIPYARDS
Houghton, Wash.

New Construction:

Four anti-submarine net tenders.

Four thousand A. S. N. T. floats.

Coast and Geodetic Survey ship.

Six seaplane tenders for U. S. Navy.

AL LARSON BOAT SHOP, INC.
Terminal Island, Calif.

New Construction:

Hulls Nos. 112-113, two mine sweepers, YMS 86 and YMS 87, for U. S. Navy. Keels laid, No. 112, June 20; No. 113, July 18, 1941. Delivery dates, No. 112, February 10; No. 113, April 10, 1942.

LOS ANGELES SHIPBUILDING & DRY DOCK CORP.
San Pedro, Calif.

New Construction:

Hulls Nos. AR6-AR8, three repair vessels for U. S. Navy.

Hulls Nos. AV 11-AV 13, three seaplane tenders for U. S. Navy.

MOORE DRY DOCK CO.
Oakland, Calif.

New Construction:

Hulls Nos. 201-203, three cargo and passenger vessels for U. S. Maritime Commission and Alcoa Steamship Co. 442′ x 62′ x 25′; depth molded to bridge deck 41′6″; 8500 hp; 17 knots speed; passenger carrying capacity 38. Keel laying dates, March 26, June 3 and August 6, 1941. Launching date, No. 201, October 21, 1941. Estimated delivery dates, January 1, March 15 and June 1, 1942.

Hulls Nos. 212-213, two submarine tenders, for U. S. Navy. Keels laid, No. 212, July 31; No. 213, September 15, 1941.

Five submarine rescue vessels for U. S. Navy. Hull laid for one, September 15, 1941.

Hulls Nos. 214-219, six C-2 cargo vessels for U. S. Maritime Commission. Keel laying date, No. 214, October 21, 1941.

Twelve C-2 cargo vessels.

OLSON & WINGE MARINE WORKS
Seattle, Wash.

New Construction:

Hulls Nos. 40-45, six 40′ motor sailers for U. S. Army. Keels laid, three, September 15, 1941.

Conversions:

Five for the U. S. Army. Total cost, $50,000.

OREGON SHIPBUILDING CORP.
Portland, Oregon

New Construction:

Hulls Nos. 170-200 and 229-240, forty-three EC-2 type cargo vessels for U. S. Maritime Commission. Keel laying dates, No. 170 and No. 171, May 19; No. 172 and No. 173, May 31; No. 174, July 11; No. 175, No. 176 and No. 177, July 18; No. 178, September 18; No. 179 and No. 180, September 20; No. 181, September 30; No. 182, October 21; No. 183, October 26, 1941. Launching date, No. 171, September 27; No. 170, October 19; No. 172, October 26, 1941.

PACIFIC BRIDGE CO.
San Francisco, Calif.

New Construction:

One seagoing drydock for U. S. Navy. Cost $1,649,000.

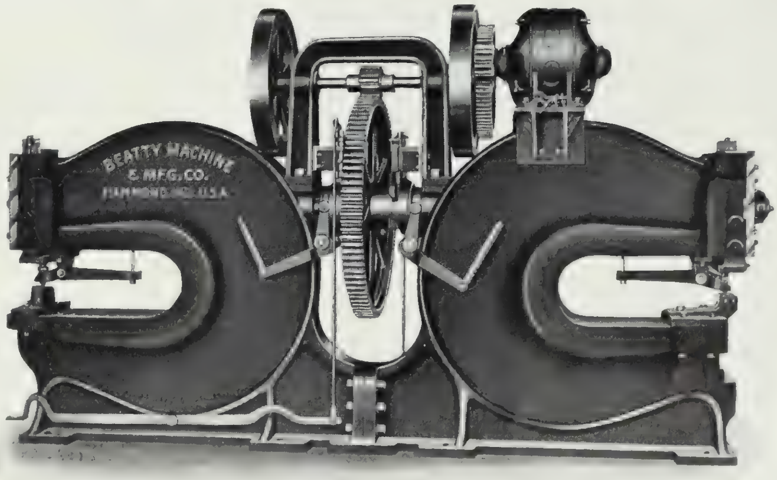
PACIFIC DRY DOCK & REPAIR CO.
Oakland, Calif.

New Construction:

One all-welded steel oil barge. 148′ x 38′ x 9′; 300,000 gal. capacity.

Lighters. Cost $284,572.

BEATTY Modernized
POWER PUNCHES and SHEARS



The No. 6 Double End Punch. Beatty punching machines have various size throat depths in both single and double ends.

for the Immediate Need of Coast Shipyards

Beatty Products are now being made available for Pacific Coast yards.

To meet your urgent requirements, we offer a complete line of punching and shearing equipment with superior construction advantages which will satisfy the most exacting buyer who requires machines that will stand up for years with minimum attention.

BEATTY EQUIPMENT eliminates unnecessary handling through combination set ups, and large die space, thereby increasing production and reducing costs.

Let Beatty Solve Your Problems

Punching & Shearing Machinery

Copers
Presses
Dies

Beatty

Bulldozers
Portable
Cranes

BEATTY MACHINE & MFG. CO. HAMMOND, INDIANA

RICHMOND SHIPBUILDING CORP.
Richmond, Calif.

New Construction:

Hulls Nos. 41-64, twenty-four EC-2 type cargo vessels for U. S. Maritime Commission **Keel laying dates,** No. 41, No. 42 and No. 43, September 17; Nos. 44 and 45, October 6; No. 46, October 8, 1941.

SAN DIEGO MARINE CONST. CO.
San Diego, Calif.

New Construction:

Four large wooden mine sweepers for U. S. Navy.

★ **One 87′ wooden tug boat.**

★ **One 64′ wooden passenger ferryboat.**

SEATTLE SHIPBUILDING AND DRY DOCK CO.
Seattle, Wash.

New Construction:

Four 136′ mine sweepers for U. S. Navy.

SEATTLE-TACOMA SHIPBUILDING CORP.
Tacoma, Wash.

PLANT No. 1

New Construction:

Hulls No. 6, Frederick Funston; No. 7, James O'Hara, two C-3 shelter deck type cargo steamers for U. S. Maritime Commission. To be converted on completion to U. S. Army troopships. Keel laying dates, April 21 and June 16, 1941. Launching dates, September 27, 1941, and January 12, 1942.

Hulls Nos. 8-11, four C-3 cargo ships for U. S. Maritime Commission. 492′ x 69′6″ x 42′6″ (molded); 8900 tons; 8500-hp steam turbine propulsion; cost $2,990,000. **Keel laying dates,** No. 8, June 18; No. 9, October 1; No. 10, October 27, 1941; No. 11, January 11, 1942. Launching dates, No. 8, October 21, 1941; No. 9, January 15; No. 10, February 14; No. 11, April 29, 1942. Delivery dates, No. 8, January; No. 9, April; No. 10, May; No. 11, July, 1942.

Hulls Nos. 12, Patapsco; 13, Rappahannock; 14, Rio Grande; 15, Wabash; 16, Susquehanna; five TI-MT-MI tankers for U. S. Navy. 310′9″ x 48′6″ x 19′9′. Keel laying dates, No. 12, February 17; No. 13, May 6; No. 14, May 10; No. 15, July 20; No. 16, August 3, 1942. Launching dates, No. 12, May 8; No. 13, July 18; No. 14, August 1; No. 15, October 3; No. 16, October 18, 1942. Delivery dates, No. 12, September 2; No. 13, October 28; No. 14, November 1, 1942; No. 15, January 15; No. 16, February 1, 1943.

Hulls Nos. 17-46, thirty C-3 cargo vessels for U. S. Maritime Commission. 492′ x 69′6″ x 42′6″; 8900 tons; 8500-hp steam turbine propulsion. **Keel laid, No. 17, November 3, 1941.** Delivery dates, first, June, 1942; last, October, 1943.

SEATTLE PLANT

New Construction:

Twenty-five destroyers for U. S. Navy.

THE SHAIN MANUFACTURING CO.
Seattle, Washington

New Construction:

One 65′ ferryboat for U. S. Navy.

One model 30 trimmer ship Air Flo sedan for Chas. Cole, Seattle; Chrysler Crown.

One model 36 trimmer ship Air Flo sedan for Paul Isaacson, Seattle; Chrysler Crown.

One model 50 trimmer ship ferry for Horluck Trans. Co., 110-hp Buda diesel.

One model 49 trimmer ship, express cruiser, for stock.

One 50′ commodore model trimmer ship for E. Ramey.

One 38′ sedan trimmer ship for U. S. Customs.

STEPHENS BROS.
Stockton, Calif.

New Construction:

Three large wooden mine sweepers for U. S. Navy.

TODD-CALIFORNIA SHIPBUILDING CORP.
Richmond, Calif.

New Construction:

Thirty cargo vessels for British Purchasing Commission. 10,000 dwt; 416′ long, 57′ beam. Cost $50,000,000. First vessel, Ocean Vanguard, launched August 16, 1941.

TODD-SEATTLE DRY DOCKS
Seattle, Wash.

Conversion work.

UNITED ENGINEERING CO., LTD.
San Francisco, Calif.

New Construction:

Hulls Nos. 17-20, four 205′ Navy fleet tugboats, for U. S. Navy.

Hulls Nos. 21-24, four 205′ Navy fleet tugboats, for U. S. Navy.

WESTERN BOAT BUILDING CO., INC.
Tacoma, Wash.

New Construction:

Hull No. 146, M. V. Colonel Leon M. Logan, for U. S. Army. 400-hp Atlas diesel. **Delivery date, November 1, 1941.**

Hulls Nos. 147-148, two U. S. Minesweepers, Y.M.S. 133-Y.M.S. 134. Keel laying dates, No. 147, June 23, 1941; No. 148, August 12, 1941. **Launching date, No. 147, November 15, 1941.**

Hull No. 146, boat, purchased by Army Quartermaster General. 95′ x 24′ x 11′1″. **Delivery date, November 1, 1941.**

★ **Hull No. 149, fishing boat** for stock; 95′ x 26′.

WESTERN PIPE AND STEEL CO.
South San Francisco, Calif.

New Construction:

Hulls Nos. 62-65, 77-95, twenty-three C-3 cargo ships for U. S. Maritime Commission. 492′ x 69′ x 42′6″; 8900 tons; 8500-hp; steam propulsion; $2,990,000 each. Keel laying dates, No. 62, April 17; No. 63, May 29; No. 64, July 17; No. 65, September 30, 1941. Launching dates, No. 62, September 27, 1941.

WILLAMETTE IRON & STEEL CORP.
Portland, Ore.

New Construction:

Two minelayers, CM6, U. S. S. Catskill, and CM7, U. S. S. Ozark, for U. S. Navy.

Atlantic, Lakes, Rivers

ALABAMA DRY DOCK & SHIPBUILDING CO.
Mobile, Ala.

New Construction:

Hulls Nos. 228-229, two tugs for Mobile Towing & Wrecking Co.

Hull No. 230, tug, for stock.

Hulls Nos. 231-243, thirteen all-welded Emergency cargo vessels for U. S. Maritime Commission. Cost $19,500,000.

Hull No. 244, 18,000-ton floating dock, for Todd Shipyards Corp., Galveston.

LESTER F. ALEXANDER CO.
New Orleans, La.

New Construction:

One tug, Galeta, for U. S. Engineers, Philadelphia, Pa., for use at Panama Canal. 220-hp Atlas Imperial engine.

One barge for Southern Tug and Barge Co. 34′ x 150′ x 8′6″.

★ **Four Type A-300 steel barges** for Louisiana Materials Co.; 30′x110′x7′6″.

★ **One tug, South Wind,** for stock; 400-hp Atlas Imperial diesel.

★ **One tug** for stock; 120-hp Atlas Imperial diesel.

AMERICAN BRIDGE COMPANY
Pittsburgh, Pa.

New Construction:

Eight dump scows. 160′ x 50′6″ x 13′6″; for Panama Canal.

Ten coal barges for stock. 175′ x 26′ x 11′.

Sixteen sand barges for the Panama Canal. 160′ x 50′6″ x 13′6″.

Sixty coal barges for Carnegie-Illinois Steel Corp. 175′x26′x11′.

Five barges for U. S. Engineers Office, Panama Canal District. 126′x26′x11′.

AMERICAN CAR & FOUNDRY CO.
Wilmington, Delaware

New Construction:

Thirty-eight 45′ lighters, equipped with tanks for carrying liquids, for U. S. Navy. Total cost $1,020,262. **Delivery date, 26 up to November 12; balance in December, 1941.**

Four 135′ mine sweepers for Navy Dept., Bureau of Supplies and Accounts. Total cost $1,340,000.

THE AMERICAN SHIP BUILDING CO.
Cleveland, Ohio

New Construction:

Twelve net tenders for U. S. Navy; (6 at Lorain, Ohio; 6 at Cleveland, Ohio). 151′8″ x 30′6″ x 16′6″; diesel-electric propulsion; contract price $6,357,000. **All delivered as of November 1, 1941.**

Four diesel trawlers for General Seafoods Corp. 146′8″ L. O. A. x 26′0″ x 14′4″. (2 at Lorain, Ohio; 2 at Cleveland, Ohio.) **Delivered, November 13, 1941.**

Eight mine sweepers (4 at Lorain, Ohio; 4 at Cleveland, Ohio) for U. S. Navy; 220′ O.A. x 32′ x 17′; diesel-electric propulsion; contract price, $13,736,000.

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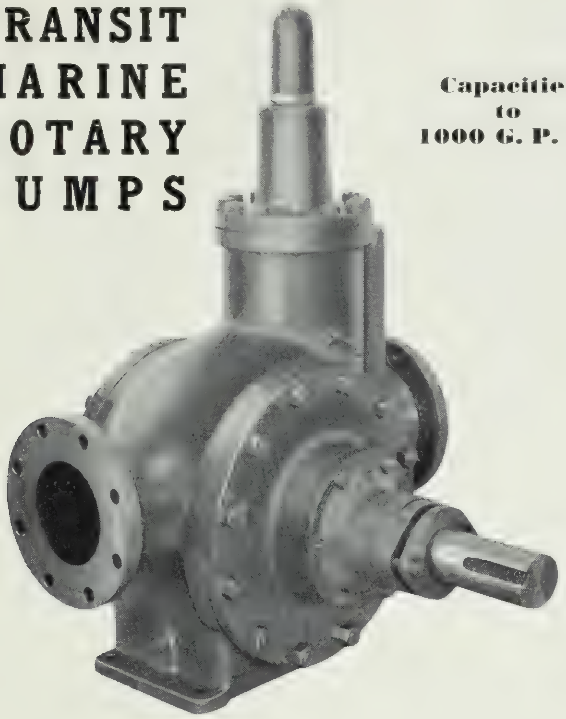

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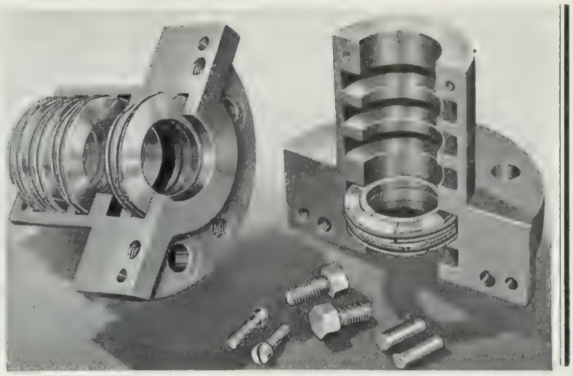

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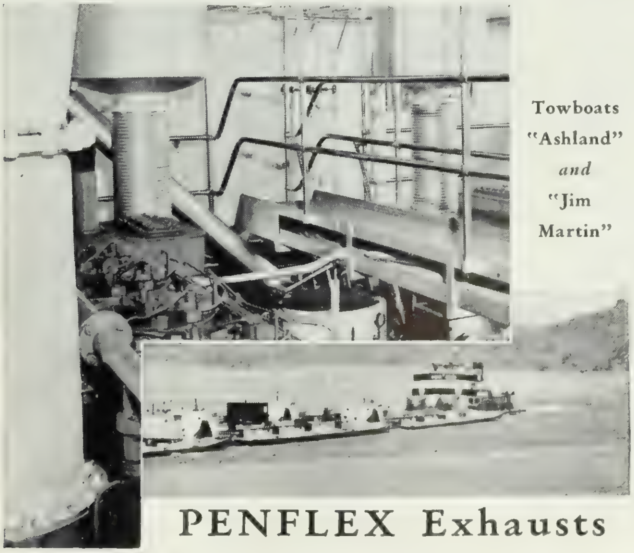

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Fifteen 2500-ihp, three cylinder triple expansion engines for Maritime Commission design EC2-S-C1 cargo vessels.

BATH IRON WORKS

Bath, Maine

New Construction:

Hulls Nos. 186-187, two cargo ships for American Export Lines. 400′ x 60′ x 39′. **Delivery dates, No. 186, December, 1941;** No. 187, January, 1942.

Hulls Nos. 188-189, DD457 and DD458, two destroyers for U. S. Navy. **Delivery dates November, 1941, and January, 1942.**

Hulls Nos. 190-195, DD449-451, 467-469, six destroyers for U. S. Navy.

Hulls Nos. 196-206, DD507-DD517, eleven destroyers for U. S. Navy.

Hulls Nos. 208-213; DD629-DD631; DD 642-DD644; six destroyers for U. S. Navy.

BETHLEHEM STEEL COMPANY

Shipbuilding Division—Fairfield Yard
Baltimore, Md.

New Construction:

Hulls Nos. 2001-2062, sixty-two EC-2 type cargo vessels, for U. S. Maritime Commission. **Keel laying dates,** No. 2001, March 30; No. 2002, May 15; No. 2003, June 21; No. 2004, June 21; No. 2005, July 15; No. 2006, July 15; No. 2007, August 15; No. 2008, August 25; No. 2009, September 3; No. 2010, September 12; No. 2011, September 22; No. 2012, September 27; **No. 2013, October 13, 1941.** Launching date, No. 2001, September 27, 1941.

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BETHLEHEM STEEL COMPANY, INC.

Shipbuilding Division—Fore River Yard
Quincy, Mass.

New Construction:

Hull No. 1478, Massachusetts, 35,000-ton battleship for U. S. Navy. Keel laid July 20, 1939. Launched September 23, 1941.

Hulls Nos. 1479, San Diego; and 1480, San Juan; two 6000-ton cruisers for U. S. Navy. Keels laid March 27 and May 15, 1940. Launching date, No. 1479, July 26; No. 1480, September 6, 1941.

Hull No. 1484, cargo vessel for U. S Maritime Commission. 450′ x 66′ x 42′3″; 16½ knots; geared turbines and water tube boilers; 14,500 tons. Launching date November 16, 1940.

Hulls Nos. 1490-1491, two tankers for Sinclair Refining Co., 10,700 tons dwt. Keel laid, No. 1490, May 31, 1941. Launching date, No. 1490, September 27, 1941.

Hulls Nos. 1492-1493, two tankers for Sinclair Refining Co. 15,450 tons dwt. Keel laying date, No. 1492, August 9, 1941.

Hulls Nos. 1494-1497, four heavy cruisers for U. S. Navy. Keel laying dates, No. 1494, May 26; No. 1495, June 30; No. 1496, September 3; No. 1497, October 9, 1941.

Hulls Nos. 1498-1501, four light cruisers for U. S. Navy. Keel laid, No. 1498, September 23, 1941.

Hulls Nos. 1502-1503, two light cruisers for U. S. Navy.

Hulls Nos. 1504-1507, four heavy cruisers for U. S. Navy.

Hulls Nos. 1508-1511, four aircraft carriers for U. S. Navy. Keel laying date, No. 1508, July 15; No. 1509, September 15, 1941.

Hulls Nos. 1513-1515, three trawlers. Keels laid, No. 1513, March 26; No. 1514, June 14; No. 1515, July 12, 1941. Launching dates, No. 1513, July 10; No. 1514, October 20; **No. 1515, November 4, 1941. Delivery dates, No. 1513, October 22; No. 1514, November 6, 1941.**

Hulls Nos. 1516-1519, four 1650-ton destroyers for U. S. Navy. Keel laying date, No. 1516, May 1; No. 1517, May 20, 1941.

BETHLEHEM STEEL COMPANY, INC.

Shipbuilding Div.—Sparrows Point Yard
Sparrows Point, Md.

New Construction:

Hull No. 4348, C-1 cargo vessel. LOA 416′, LBP 395′, beam 60′, depth 37′6″. Keel laid March 13, 1941.

Hulls Nos. 4351-4352, two cargo vessels for Seas Shipping Co. 450′ x 66′ x 34′; 6300 hp; 8500 gross tons. Keel laying dates, No. 4351, December 12, 1940; No. 4352, January 22, 1941. Launching date, No. 4351, July 26, No. 4352, August 29, 1941.

Hulls Nos. 4354-4356, three oil tankers for Socony Vacuum Oil Co. 487′6″ x 68′ x 37′; 12,000 hp, 9800 gross tons. Keel laying dates, No. 4354, September 16, 1940; No. 4355, April 23; No. 4356, July 8, 1941. Launching date, No. 4354, July 1, 1941.

Hulls Nos. 4358-4359, two oil tankers for Socony Vacuum Oil Co. 487′6″ x 68′ x 37′; 12,000 hp; 9800 gross tons. Keel laid, No. 4358, August 1, 1941.

Hulls Nos. 4360-4361, two oil tankers for Union Oil Co. 442′ x 64′ x 34′10″; 3500 hp; 8000 gross tons. Keel laying date, No. 4360, June 18, 1941.

Hulls Nos. 4362-4364, three cargo and passenger vessels for Mississippi Shipping Co. 465′ x 65′6″ x 39′9″; 7800 hp; 8300 gross tons. Keel laid, No. 4362, September 4, 1941.

Hull No. 4365, oil tanker for Richfield Oil Co. 442′ x 64′ x 34′10″; 3500 hp; 8000 gross tons. Keel laid May 21, 1941.

Hulls Nos. 4367-4368, two oil tankers

for Panama Transport Co. 487′6″ x 68′ x 37′; 7000 hp; 9800 gross tons.

Hull No. 4369, oil tanker for Continental Oil Co. 442′ x 64′ x 34′10″; 3500 hp; 8000 gross tons.

Hulls Nos. 4371-4372, two oil tankers for Gulf Oil Co. 442′ x 64′ x 34′10″.

Hull No. 4373, tanker for Panama Transport Co. 487′6″ x 68′ x 37′; 7000 hp; 9800 gross tons.

Hulls Nos. 4374-4375, two tankers for Union Oil Co. of Calif. 487′6″ x 68′ x 37′; 7000 hp; 9800 gross tons.

Hulls Nos. 4376-4377, two tankers for Socony Vacuum Oil Co. 487′6″ x 68′ x 37′; 4800 hp: 9800 gross tons.

BETHLEHEM STEEL COMPANY, INC.

Shipbuilding Div.—Staten Island Yard
Staten Island, N. Y.

New Construction:

Hulls Nos. 8021-8022, two destroyers for U. S. Navy.

Hulls Nos. 8023-8029; 8033-8035; ten destroyers for U. S. Navy.

BURGER BOAT CO.

Manitowoc, Wisconsin

New Construction:

One yacht, 65′x16′x8′, Buda diesel engine.

One ferryboat, 110′ x 32′ x 8′, 330-hp Gray diesel engine.

Six 135′ wooden motor mine sweepers for U. S. Navy.

IRA S. BUSHEY & SONS, INC.

Brooklyn, N. Y.

New Construction:

Hull No. 497, tug. 90′; 805-hp F-M diesel. **Delivery date, November, 1941.**

Hull No. 498, 156-foot oil tanker. Delivery date, February, 1942.

Hull No. 499, 156-foot oil tanker. Delivery date, March, 1942.

Hull No. 500, wooden drydock section for Bethlehem Steel Co. Delivery date, October, 1942.

Hulls Nos. 503-504, two 100′ steel tugs, for U. S. Maritime Commission. 805-hp.

Hulls Nos. 505-506, two drydocks, for U. S. Navy.

Hulls Nos. 507-509, three 100′ steel tugs, for U. S. Navy. 805 hp.

Hull No. 510, deck scow for A. J. Harper, Baltimore, Md. 117′ x 36′ x 10′.

Hulls Nos. 511-513, three 100′ steel tugs, for Maritime Commission. 805-hp.

CALUMET SHIPYARD & DRY DOCK CO.

Chicago, Illinois

New Construction:

Four all-welded distribution box boats for Quartermaster Corps., U. S. Army, 65′ x 18′, diesel propelled. Total cost $212,000. **Delivery date, two, November 7, 1941.**

Hull No. 126, all-welded steel towboat for Ashland Oil Refining Co., 145′ x 32′ x 9′, 1600-hp diesel.

Hulls Nos. 131-132, two oil barges, standard river type, for Ashland Oil & Refining Co. 195′ x 35′ x 10′.

Hulls Nos. 133-135, 142-143, two three-barge units for Ashland Oil & Refining Co. Each unit, 195′ x 35′ x 10′; center section square on both ends; both end sections square on one end, raked on opposite end.

Hull No. 136, one river towboat for Ashland Oil & Refining Co. 145′ x 32′ x 9′. 1600-hp diesel.

Hulls Nos. 137-141, five tugs for U. S. Maritime Commission. 1050-hp.

CHARLESTON SHIPBUILDING & DRYDOCK COMPANY

Charleston, South Carolina

New Construction:

Eight 205′ mine sweeping fleet tugs. Delivery for all by September, 1943.

CONSOLIDATED SHIPBUILDING CORP.

Morris Heights, N. Y.

New Construction:

Seven 165′ steel submarine chasers for U. S. Navy.

CONSOLIDATED STEEL CORP. OF TEXAS

Orange, Texas

New Construction:

Two oil barges for C. F. Pillot, 165′ x 36′ x 10′3″.

One transportation barge for Shell Oil Co., Inc. 80′ x 24′ x 5′.

Three transportation barges for Shell Oil Co., Inc. 40′ x 16′ x4′6″.

CRAMP SHIPBUILDING COMPANY

Philadelphia, Pa.

New Construction:

Six cruisers, Cleveland class, for U. S. Navy.

Four floating workshops for U. S. Navy; two being completed in wet dock; two on the ways.

DEFOE BOAT & MOTOR WORKS

Bay City, Mich.

New Construction:

Hulls Nos. 171-174, four mine sweepers for U. S. Navy, 220′ long.

Hulls Nos. 175-186, twelve 174′ escort vessels for U. S. Navy.

Hulls Nos. 187-194, eight 174′ sub-chasers for U. S. Navy.

Hulls Nos. 195-198, four 145′ tugs for U. S. Navy.

Hulls Nos. 199-204, five subchasers for U. S. Navy.

DELTA SHIPBUILDING CORP.

New Orleans, Louisiana

New Construction:

Twenty-five EC-2 Emergency type vessels for U. S. Maritime Commission. 416′ x 56′10¾″ x 37′4″; 2500-hp triple expansion engine.

THE DRAVO CORPORATION

Engineering Works Division
Pittsburgh, Pa., and Wilmington, Del.

New Construction:

Hulls Nos. 1836-1840, five 165′ type PC submarine chasers for U. S. Navy, Washington, D. C. 1675 gross tons.

Hull No. 1861, sand and gravel barge, for Keystone Sand Division. 135′ x 27′ x 8′; 255 gross tons.

Hulls Nos. 1868-1869, two 25-ton floating cranes, one each to Phil. and Norfolk U. S. Navy Yards, for U. S. Navy Dept., Washington, D. C.; 670 gross tons.

Hulls Nos. 1876-1877, two floating caisson gates for U. S. Navy, Philadelphia Navy Yard; 2330 gross tons.

Hull No. 1903, floating caisson gate for U. S. Navy, Norfolk Navy Yard; 1330 gross tons.

Hulls Nos. 1907-1911, five 165′ type AM mine sweepers for Bureau Supplies & Accounts, U. S. Navy Dept., Washington, D. C.; 1675 gross tons.

Hulls Nos. 1912-1916, five 165′ type PC submarine chasers for Bureau of Supplies & Accounts, U. S. Navy Dept., Washington, D. C.; 1675 gross tons.

Hull No. 1927, fabricated steel hull for oil barge. 165′ x 35′ x 10′; 502 gross tons.

Hulls Nos. 1928-1933, six welded steel deck barges for Delaware, Lackawanna & Western R. R., New York City. 100′ x 30′ x 9′6″; 1392 gross tons.

Hulls Nos. 1941-1945, five welded steel oil barges, for stock. 195′ x 35′ x 9′9″; 2990 gross tons.

Hulls Nos. 1946-1955, ten W-7 welded steel coal barges for stock; 175′ x 26′ x 11′; 4720 gross tons.

Hull No. 1956, 25-ton floating crane for Charleston, S. C. Navy Dept., Washington, D. C.; 335 gross tons.

Hulls Nos. 1960-1966, seven type W-7 welded bulk cargo barges for stock. 175′ x 26′ x 11′; 3304 gross tons.

Hulls Nos. 1967-1972, six welded oil barges for stock. 195′ x 35′ x 9′9″; 3588 gross tons.

Hulls Nos. 1973-1976, four welded sand and gravel barges for Keystone Sand Div. 135′ x 27′ x 8′; 1020 gross tons.

Hulls Nos. 1977-1986, ten type W-7 welded bulk cargo barges for stock. 175′ x 26′ x 11′; 4720 gross tons.

Hulls Nos. 1987-1992, six welded oil barges for stock. 195′ x 35′ x 9′9″; 3588 gross tons.

Hulls Nos. 1993-2009, seventeen covered lighters for Bureau of Supplies and Accounts, Navy Dept. 8840 gross tons.

Hulls Nos. 2010-2011, two welded side-dump scows for Bureau S. & A., Navy Dept., Washington, D. C. 115′ x 28′ x 7′6″; 240 gross tons.

Hulls Nos. 2012-2021, ten welded steel car floats, for Pennsylvania R. R., Philadelphia, Pa. 250′ x 34′ x 9′1″; 5940 gross tons.

Hulls Nos. 2022-2030, nine welded deck barges, for Erie R. R. 100′ x 30′ x 9′6″; 2088 gross tons.

Hull No. 2031, welded steel car float for Erie R. R. 250′ x 34′ x 9′1″; 594 gross tons.

Hulls Nos. 2032-2041, ten type W-7 welded coal barges for Weirton Steel Co. 175′ x 26′ x 11′; 4720 gross tons.

Hull No. 2042, caisson, for drydock for Bayonne Associates, Bayonne, N. J. 1330 gross tons.

Hulls Nos. 2043-2058, sixteen welded steel coal barges for Wheeling Steel Corporation. 10′ x 26′ x 10′8″; 9040 gross tons.

Hull No. 2059, welded cargo box barge, for Lone Star Cement Co., New York City. 180′ x 40′ x 9′6″; 607 gross tons.

Hull No. 2060, caisson, for drydock No. 2 at Charleston Navy Yard. 375 gross tons.

Hull No. 2061, caisson, for drydock No. 1 at Charleston Navy Yard. 520 gross tons.

Hulls Nos. 2062-2065, four 165′ submarine chasers, for Bureau of Ships, Navy Department, Washington, D. C. 1340 gross tons.

ELECTRIC BOAT COMPANY

Groton, Conn.

New Construction:

Two submarines, SS206, Grampus; SS208, Grayback; for U. S. Navy. Cost $2,937,000 each. Keels laid, Grampus, February 4, 1940; Grayback, April 3, 1940.

One submarine, SS204, Mackeral, for U.S. Navy. Keel laid October 6, 1939. Launched September 28, 1940.

Three submarines, SS212, Gato; SS213, Greenling; SS214, Grouper; for U. S. Navy. Cost $2,957,000. Keels laid, Gato, October 5, 1940; Greenling, November 12, 1940.

Thirteen submarines, SS215, Growler; SS216, Grunion; SS217, Guardfish; SS218, Albacore; SS219, Amberjack; SS220, Barb; SS221, Blackfish; SS222, Bluefish; SS223, Bonefish; SS224, Cod; SS225, Cero; SS226, Corvina; SS227, Darter. Cost $2,795,000 each.

Twenty-five submarines, SS240-SS264.

THE FEDERAL SHIPBUILDING AND DRY DOCK COMPANY

Kearny, N. J.

New Construction:

Hulls Nos. 168-169, CL51, Atlanta; and CL52, Juneau; two 6000-ton cruisers for U. S. Navy. Keels laid April 22 and May 27, 1940. Launching date, No. 168, September 6; No. 169, October 25, 1941.

Hulls Nos. 180-186, seven C-2 cargo ships for U. S. Maritime Commission. Keel laid, No. 180, April 17; No. 181, June 5, 1941. **Launching date,** No. 180, September 27; **No. 181, November 12, 1941.**

Hulls Nos. 191-193, three tankers for Sinclair Refining Co. 15,000 dwt. Keel laid, No. 191, April 17, 1941. Launching date, No. 191, October 21, 1941.

Hulls Nos. 194-197, four destroyers for U. S. Navy. Keels laid, Nos. 194-195, December 2, 1940; Nos. 196-197, December 16, 1940. Launching dates, No. 194 and 195, July 26; No. 196 and 197, September 26, 1941.

Hulls Nos. 198-203, six destroyers for U. S. Navy.

Hulls Nos. 204-205, two destroyers for U. S. Navy.

Hulls Nos. 206-213, eight destroyers for U. S. Navy. Keels laid, No. 206 and 207, February 11; No. 208 and No. 209, July 31, 1941.

Hulls Nos. 214-218, five destroyers for U. S. Navy.

Hulls Nos. 219-221, three cruisers for U. S. Navy.

Hulls Nos. 222-227, six destroyers for U. S. Navy.

Hulls Nos. 229-230, two destroyers for U. S. Navy.

Hulls Nos. 231-232, two destroyers for U. S. Navy.

Hulls Nos. 233-240, eight cargo ships for the U. S. Maritime Commission.

Hulls Nos. 241-264, twenty-four C-2 cargo vessels for U. S. Maritime Commission.

GREAT LAKES ENGINEERING WORKS

River Rouge, Michigan

New Construction:

Hulls Nos. 287-289, three bulk freighters for Pittsburgh S. S. Co. 640' x 67' x 35'; 18,000 dwt; 4000-hp steam turbine engines. Keel laying dates, No. 287, June 16; No. 288, July 1; No. 289, August 6, 1941.

HENRY C. GREBE & CO., INC.

Chicago, Illinois

New Construction:

One 70' twin-screw diesel cruiser yacht.

Two 135' mine sweepers for U. S. Navy.

Five 65' steel harbor tugs.

GREENPORT BASIN & CONST. CO.

Greenport, L. I., N. Y.

New Construction:

Twelve 135' motor mine sweepers YMS 20-31, for U. S. Navy.

GULFPORT BOILER & WELDING WORKS, INC.

Port Arthur, Texas

New Construction:

Hulls Nos. 190-194, five diesel-electric tugs, for General Motors Corp., Cleveland Diesel Engine Division. 100' x 24' x 12'4"; 1000 shp. **Delivery dates, No. 190, November 21; No. 191, December 21, 1941;** No. 192, January 21; No. 193, February 28; No. 194, March 28, 1942.

GULF SHIPBUILDING CORP.

Chickasaw, Ala.

New Construction:

Four 2100-ton destroyers for U. S. Navy. Launching dates, first, November 15; second, December, 1941.

Two cargo vessels for Waterman Steamship Corporation. 445' x 63' x 40'6"; shelter deck type; geared turbine drive; 15½ knots service speed.

Six 220' mine sweepers, for U. S. Navy.

Fourteen C-2-S-E1 cargo vessels for U. S. Maritime Commission. 445' x 63' x 40'6"; shelter deck type; geared turbine drive; 15½ knots service speed.

HOUSTON SHIPBUILDING CORP.

Houston, Texas

New Construction:

Hulls Nos. 1-37, thirty-seven EC-2 cargo vessels for U. S. Maritime Commission. Estimated delivery dates, first, January 15, 1942; last, February 24, 1943.

THE INGALLS SHIPBUILDING CO.

Pascagoula, Miss., and Decatur, Ala.

Pascagoula

New Construction:

Hulls Nos. 268, 297-299, four C-3-IN passenger-cargo vessels for U. S. Lines. Completion dates, May, November, December, 1942; and February, 1943.

Hulls Nos. 265-267, three C-3-P passenger-cargo vessels for American-South African Line, Inc. **Completion dates,** December 18, 1941; January and February, 1942.

Hulls Nos. 293-296, four C-3-S-A-2 cargo vessels for U. S. Maritime Commission. Completion dates, February, March, May and June, 1942.

Hulls Nos. 325-336, twelve C3-S-A2 cargo vessels for the U. S. Maritime Commission. 492' x 69'6" x 42'6". Keel layings, from April 30 to December 31, 1943.

Hulls Nos. AN 1-4, four net layers for U. S. Navy.

Decatur

New Construction:

Hulls Nos. 343-344, two 39,000-bbl oil barges for Eddie Erlbacher, Cape Girardeau, Mo. 195' x 35' x 9'9". **Delivery date, December 24, 1941.**

Four 9,000-bbl oil barges for Standard Oil Company, Cleveland, Ohio. 195' x 35' x 9'9". **Delivery date, December 1, 1941.**

Hulls Nos. 345-348, four 1300-bbl. oil barges, for Illinois Oil Company, Rock Island, Ill. 230' x 40' x 9'6". Delivery date, April 20, 1942.

Hull No. 349, derrick barge, for U. S. Engineer Department, Galveston, Texas. 80' x 40' x 6'6". Delivery date, March, 1942.

Hulls Nos. 351-354, four cargo barges, for Quartermaster Corps, U. S. Army. 210' x 40' x 15'. Delivery date, April, 1942.

GEORGE LAWLEY & SON CORP.

Neponset, Mass.

New Construction:

Twelve 45' tank lighters for U. S. Navy.

Two 127' fish trawlers for Booth Fisheries Co. Diesel powered.

Five boats for repair work for U. S. Navy.

Ten 165' submarine chasers for U. S. Navy.

Conversion:

90' launch Cutty Sark to U. S. Army launch Captain Dean C. Howard.

LEVINGSTON SHIPBUILDING CO.

Orange, Texas

New Construction:

Hull No. 185, ocean tug for U. S. Navy; 135' x 30' x 17'6".

Hulls Nos. 194-195, two tugs for stock. 66' x 17' x 8'; 300-hp Atlas diesel.

Hulls No. 202, tug, for Pan American. 74' x 20' x 9'; 400-hp Atlas diesel.

Hull No. 203, coastwise tug for stock. 85' x 24' x 9'11"; 600-hp Atlas diesel.

Hulls Nos. 204-205; 207-210; six 8500-bbl oil barges for Pan American. 173' x 8'6" x 39'.

Hull No. 206, tug, for River Terminals. 74' x 20' x 9'; 400-hp Atlas diesel.

Hull No. 211, tug. 105' x 25' x 9'6"; 1000-hp General Motors diesel.

Hull No. 212, tug, for stock. 105' x 25' x 13'6"; 1000-hp General Motors diesel.

Hull No. 213, tug, for stock. 85' x 23' x 9'6"; 600-hp Superior diesel.

Hull No. 214, tug, for River Terminals Corp. 74' x 20' x 9'; 400-hp Atlas diesel.

Hull No. 215, U. S. S. Sea Otter II; cargo vessel, for U. S. Government. 250' x 40' x 21'.

Hulls Nos. 217-220, four 143' ocean tugs for General Motors Sales Corp.

THE LUDERS MARINE CONSTRUCTION CO.

Stamford, Connecticut

New Construction:

Seven 65' Naval tugs, YT160-YT169. Cooper-Bessemer diesel engines. **Completed.**

Two submarine chasers, PC505-PC506, for U. S. Navy.

Nine small subchasers for U. S. Navy.

Six 65' all-welded steel, single-screw distribution box boats for Quartermaster Corps, U. S. Army. Diesel propelled. **Completed.**

Seven 165' steel subchasers for U. S. Navy. Keel laid, first vessel, July, 1941.

Four wooden subchasers for U. S. Navy.

MANITOWOC SHIPBUILDING CORP.

Manitowoc, Wisconsin

New Construction:

Ten submarines, SS265-274, for U. S. Navy.

MARIETTA MANUFACTURING CO.

Point Pleasant, W. Va.

New Construction:

Two net tenders, YN 15-16, for the U. S. Defense Commission. Total cost $2,040,000. Launching dates, June 19, July 2, 1941. **Delivery dates, YN 15, November 7; YN 16, December 15, 1941.**

Hulls Nos. 474-489, sixteen all-steam propelled mine planters, for the U. S. Army. Cost about $12,000,000. **Keel laying dates,** No. 474, May 14; No. 475, May 20; No. 476, June 24; No. 477, July 11; **No. 478, November 5, 1941. Launching date, No. 474, November 4, 1941.**

MARINE IRON & SHIPBUILDING CO.

Duluth, Minnesota

New Construction:

Hulls Nos. 70-72, three 180' cutters of "Cactus" type for U. S. Coast Guard.

JOHN H. MATHIS CO.

Camden, N. J.

New Construction:

Four anti-submarine net tenders for U. S. Navy.

Three 220' mine sweepers for U. S. Navy.

MIAMI SHIPBUILDING CORP.

Miami, Florida

New Construction:

Thirty-five high-speed, off-shore patrol boats.

NEWPORT NEWS SHIPBUILDING & DRYDOCK CO.

Newport News, Va.

New Construction:

Hull No. 378, battleship 58, Indiana, for U. S. Navy. Keel laid November 20, 1939.

Hull No. 385, aircraft carrier No. 8, Hornet, for U. S. Navy. Launched December 14, 1940.

Hull No. 386, single-screw combination passenger and cargo vessel for U. S. Maritime Commission. 465' x 69'6" x 42'6"; gross

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tonnage about 9100 tons. **Delivery date, November 6, 1941.**

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Hulls Nos. 392-394 (CV9-CV11), three aircraft carriers for U. S. Navy.

Hulls Nos. 395-398 (CV12-CV15), four aircraft carriers for U. S. Navy.

Hulls Nos. 399-400 (CL80-CL81), two light cruisers for U. S. Navy.

THE NEW YORK SHIPBUILDING CORPORATION
Camden, N. J.

New Construction:

BB57, South Dakota, battleship for U. S. Navy. Keel laid July 5, 1939.

AR5, Vulcan, repair ship for U. S. Navy. Keel laid December 26, 1939.

CL55, Cleveland; and CL56, Columbia; two cruisers for U. S. Navy. Order placed March 23, 1940.

CL57 and CL58, two cruisers for U. S. Navy. Order placed June 12, 1940.

AV7, Currituck, seaplane tender for U. S. Navy.

CL59-CL61, three cruisers for U. S. Navy.

CB1-CB6, six cruisers for U. S. Navy.

CL76, four cruisers for U. S. Navy.

NORTH CAROLINA SHIPBUILDING CO.
Wilmington, N. C.

New Construction:

Hulls Nos. 1-37, thirty-seven all-welded steel EC-2 cargo vessels for U. S. Maritime Commission. Keel laying dates, No. 1, May 22; No. 2, May 22; No. 3, May 28; No. 4, August 22; No. 5, September 3; No. 6, September 4; No. 7, October 12; No. 8, October 21, 1941.

THE PUSEY & JONES CORP.
Wilmington, Del.

New Construction:

Hull No. 1076, C-1A cargo ship. Launched September, 1941. Delivery date, December, 1941.

Hulls Nos. 1082, Hains; and 1083, Hoffman; two seagoing hopper dredges for War Dept., U. S. Engineers Office, Philadelphia, Pa. 215′10½″ x 40′ x 15′6″; approx. 2000 gross tonnage; diesel-electric propulsion, 950 shp. Delivery dates, February and August, 1942.

Hulls Nos. 1084-1093, ten C-1A type cargo ships for U. S. Maritime Commission. 412′3″ x 60′ x 37′6″; 9000 dwt; 4000-hp steam turbine propulsion.

R. T. C. SHIPBUILDING CORP.
Camden, N J.

New Construction:

Hull No. 137, 995-ton motor tanker. 190′ x 36′ x 12′.

Hulls Nos. 138-139, two 985-ton motor tankers. 190′ x 36′ x 12′.

★ **Hulls Nos. 140-142, three tankers** for U. S. Navy.

SOUTH PORTLAND SHIPBUILDING CORP.
Portland, Maine

New Construction:

Hulls Nos. 201-216, sixteen EC-2 type cargo vessels, for U. S. Maritime Commission.

SUN SHIPBUILDING AND DRY DOCK COMPANY
Chester, Pa.

New Construction:

Hulls Nos. 202-206, five C-2 cargo vessels for U. S. Maritime Commission. 474′ x 63′ x 40′6″; 7400 gross tons; diesel propelled; 7500 shp; 16 knots. **Launching dates,** No. 202, August 23; No. 203, September 20; No. 204, October 18; **No. 205, December 6, 1941;** No. 206, January 14, 1942. **Delivery dates, No. 202, December 1; No. 203, December 15; No. 204, December 31, 1941;** No. 205, February 10; No. 206, March 15, 1942.

Hulls Nos. 213-216; 219-220, six tankers for Panama Transport Co. 547′3″ x 70′ x 40′; 11,400 gross tons; 7500 shp; 15 knots speed. Launching and delivery dates, 1942-1943.

Hull No. 218, tanker for Standard Oil Co. of N. J. 547′3″ x 70′ x 40′; 11,400 gross tons; 7500 shp; 15 knots speed. Launching date, September, 1941. **Delivery date, November, 1941.**

Hulls Nos. 221-222, two tankers for Keystone Tankship Corp. 520′ x 68′ x 37′; 10,600 gross tons; turbine; 12,000 shp; 16½ knots. Keel laying dates, No. 221, June 12; No. 222, September 11, 1941. Launching dates, No. 221, October 4, 1941; No. 222, January 10, 1942. Delivery dates, No. 221, December, 1941; No. 222, March, 1942.

Hulls Nos. 223-225, three tankers for The Texas Co. 513′10″ x 68′ x 36′; 9300 gross tons; turbine; 9000 shp; 16 knots. Launching and delivery dates, 1942.

Hull No. 226, tanker for Kaymar Tankship Corp. 520′ x 68′ x 37′; 10,600 gross tons; turbine; 12,000 shp; 16½ knots. **Keel laying date, December, 1941.**

Hulls Nos. 227-228, two tankers for Seamar Tankship Corp. 520′ x 68′ x 37′; 10,600 gross tons; turbine; 12,000 shp; 16½ knots. Keel laying dates, 1942.

Hull No. 230, tanker for Atlantic Refining Co. 474′ x 65′ x 37′; 8000 gross tons; turbo-electric; 5000 shp; 14½ knots. Launching date, September 19, 1941. Delivery date, 1942.

Hulls Nos. 231-232, two tankers for Keystone Tankship Corp. 520′ x 68′ x 37′; 10,600 gross tons; turbine; 12,000 shp; 16½ knots. Delivery date, 1942.

Hulls Nos. 233 and 240, two tankers for Gulf Oil Corp. 485′ x 68′ x 36′; turbine propelled; 14½ knots. Delivery dates, August, 1942, and December, 1942.

Hull No. 234, tanker for Sun Oil Co. 547′3″ x 70′ x 40′; 11,400 gross tons; diesel propelled; 7500 shp; 15 knots. Delivery date, 1942.

Hulls Nos. 235 and 237, two tankers for Standard Oil Co. of N. J. 547′3″ x 70′ x 40′; 11,400 gross tons; turbine; 7500 shp; 15 knots. Delivery date, 1942.

Hull No. 236, tanker for Atlantic Refining Co. 543′10″ x 70′ x 40′; 11,600 gross tons; turbo-electric; 5000 shp; 13 knots. Delivery date, 1942.

Hulls Nos. 238-239, two tankers for Standard Oil Co. of Calif. 521′ x 70′ x 40′; turbine propelled; 15½ knots. Delivery dates, November and December, 1942.

Hulls Nos. 241-312, seventy-two tankers.

TAMPA SHIPBUILDING CO.
Tampa, Fla.

New Construction:

Hulls Nos. 37-40, four C-2 type cargo vessels for U. S. Navy. 459′ x 63′ x 31′6″; 9291 dwt tons.

Three destroyer tenders, Piedmont, Sierra and Yosemite.

TODD-BATH SHIPBUILDING CORP.
Bath, Maine

New Construction:

Hulls Nos. 1-30, thirty cargo vessels for British Purchasing Commission. Cost $50,000,000. Keel laying dates, No. 1, May 24; No. 2, June 4; No. 3, June 18; No. 4, June 18; No. 5, August 2; No. 6, July 16; No. 7, July 25, 1941. **Launching dates, Nos. 1 and 2, November 29, 1941;** Nos. 3 and 4, January 1; Nos. 5, 6 and 7, February, 1942.

F. B. WALKER & SONS
Pascagoula, Mississippi

New Construction:

One all-welded steel tug for Florida interests. 68′ x 17′ x 8′6″; 300-hp Atlas diesel.

One all-welded steel tug for Colle Towing Co. 75′ x 19′ x 9′; 400-hp Atlas diesel.

One all-welded steel barge, 132′x32′x8′6″.

Two all-welded steel oil barges, 180′x36′ x 9′.

Two steel tugs, 75′ x 19′ x 8′6″.

WHEELER SHIPYARDS, INC.
Brooklyn, N. Y.

New Construction:

Ten bomb target boats for U. S. Navy.

Forty 83′ cutters for U. S. Coast Guard. Cost $42,500 each.

Deck Officers' Licenses for October

SEATTLE

Name and Grade	Class	Condition
V. Lams, Chief	SS, any GT	RG
E. R. Vessey, 3d Mate	SS, any GT	O

HONOLULU, T. H.

Name and Grade	Class	Condition
H. C. von Weien, Chief	SS & MS, any GT	RG
K. E. Katlas, Master	SS & MS, any GT	RG

JUNEAU, ALASKA

Name and Grade	Class	Condition
L. O. Millican, 2nd Mate	SS & MS, any GT	O

SAN PEDRO

Name and Grade	Class	Condition
J. E. Hihn, Chief	SS, any GT	RG
R. E. Lenahan, Chief	SS, any GT	RG
W. A. Rogers, Chief	SS, any GT	RG

SAN FRANCISCO

Name and Grade	Class	Condition
B. E. Floren, Master	SS, any GT	RG
C. P. Viveiros, Master	SS, any GT	RG
R. Smith, Chief	SS, any GT	RG
E. Hrubik, 2nd Mate	SS, any GT	RG
L. J. Leoni, 2nd Mate	SS, any GT	RG
A. R. Tobin, 2nd Mate	SS, any GT	RG

Abbreviations: SS is steamship; MS is motorship; GT is gross tonnage; O is original license; RG is raise of grade. All of these licenses are for ocean service.

Engineers' Licenses for October

SEATTLE

Name and Grade	Class	Condition
W. A. Sheldon, Chief	MS, any GT	RG

SAN PEDRO

Name and Grade	Class	Condition
G. Lindsay, Chief	SS, 750 tons	RG
C. Sobieski, 1st Asst.	SS, any GT	RG
D. McQ. George, Chief	MS, any GT	RG

PORTLAND

Name and Grade	Class	Condition
J. B. Landy, 2nd Asst.	SS, any GT	RG

SAN FRANCISCO

Name and Grade	Class	Condition
F. X. George, Chief	SS, any GT	RG
R. G. Gonzalez, Chief	SS, any GT	RG
R. H. Maddox, Chief	SS, any GT	RG
J. E. Myers, Chief	SS, any GT	RG
L. Simard, Chief	SS, any GT	RG
A. D. Solari, Chief	SS, any GT	RG
W. Allan, 1st Asst.	SS, any GT	RG
E. W. De Martini, 1st Asst.	SS, any GT	RG
C. M. Johnson, 1st Asst.	SS, any GT	RG
D. M. Smith, 1st Asst.	SS, any GT	RG
R. L. White, 1st Asst.	SS, any GT	RG
W. L. Whitson, 1st Asst.	SS, any GT	RG
P. Battinich, 2nd Asst.	SS, any GT	O
P. R. Blades, 2nd Asst.	SS, any GT	O
C. A. Falk, 2nd Asst.	SS, any GT	O
J. N. Napoleon, 2nd Asst.	SS, any GT	O
F. Paulos, 2nd Asst.	SS, any GT	O
R. B. Black, 2nd Asst.	SS, any GT	RG
G. S. Cronk, 2nd Asst.	SS, any GT	RG
T. W. Harris, 2nd Asst.	SS, any GT	RG
R. C. Pucket, 2nd Asst.	SS, any GT	RG
W. D. Starck, 2nd Asst.	SS, any GT	RG
P. M. Van Aken, 2nd Asst.	SS, any GT	RG
P. W. Blank, 3d Asst.	SS, any GT	O
C. H. Bushnell, 3d Asst.	SS, any GT	O
C. F. Hayden, 3d Asst.	SS, any GT	O
J. J. Ruggiero, 3d Asst.	SS, any GT	O
L. F. Landers, Chief	MS, any GT	O

Abbreviations: SS is steamship; MS is motorship; GT is gross tonnage; O is original license; RG is raise of grade. All of these licenses are for ocean service.

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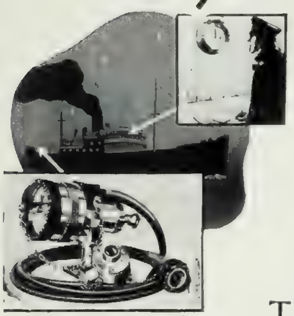

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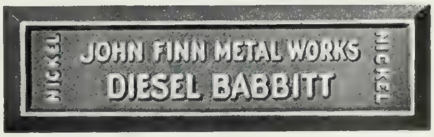

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HOT off the PRESS

The Catalogs of Today Become the Technical Handbooks of Tomorrow

Industrial Pumps: Practical information concerning pump adaptation for a wide range of duties under varying conditions is the theme of the new industrial catalog just published by Pomona Pump Co.

This brochure contains not only a profusion of illustrated case histories of varied applications, but also presents many practical drawings for laying in this type of pump.

Air Reduction—A Quarter Century of Progress, a 54-page, two-color book, setting forth a detailed description of the activities of the five companies which comprise Air Reduction Company, Inc.; illustrated both with pictures and diagrams; and completely describing the methods, the markets and the nature of the business.

The purpose of the book is to acquaint stockholders and others with what Air Reduction does, and give a full and complete description of the thousands of uses to which the company's products are put.

Many of these products are playing a vital part in numerous industries now in the forefront of national defense—for instance, shipbuilding, aviation, explosives, manufactured gas, sheet metal products and steel works, and rolling mills. The trade names under which these products are marketed are often not identified with any of the five Airco operating companies, namely: Air Reduction Sales Company, National Carbide Corporation, Wilson Welder and Metals Co., Inc., Pure Carbonic, Incorporated, and The Ohio Chemical & Mfg. Co. Still less are they associated with Air Reduction itself.

Superior Twelve-by-Fifteen Diesel Engines, a handsome 12-page, profusely illustrated bulletin (No. 136), published by the National Supply Company, Superior Engine Division.

This booklet describes the Superior vertical four-cycle type "LM" 12-inch bore and 15-inch stroke, 6- and 8-cylinder marine diesel engines, with a speed range of 400 to 515 rpm, and a capacity range of 385 to 660 shp.

These engines are completely enclosed, dust proof and oil tight, and are especially designed for rugged heavy-duty service in marine propulsion.

Cutting & Grinding Compounds. Of timely interest to shipyards operating at peak capacity to meet sharply accelerated demands for naval vessels, merchant ships and oil tankers, is a new 20-page, illustrated manual describing cutting lubricants and grinding coolants specially designed to help speed up many different machining operations required in shipbuilding.

Issued by Oakite Products, Inc., New York, N. Y., the booklet concisely reviews 53 different formulas for machining ferrous and non-ferrous metals. Among the operations described in this connection are light broaching, drilling and reaming, milling, planing, turning, slotting, shaping, wet grinding, cold sawing and light threading and tapping.

In addition, the booklet also gives considerable data on such related subjects as rust-proofing iron and steel parts between operations or for storage, preventing rust on hydraulic presses, drawing and stamping, and cleaning and disinfecting cutting and grinding solution tanks and lines.

Electric Couplings for Marine Service, Publication F-8635, Westinghouse Electric and Manufacturing Co., a six-page folder describing the use of the Westinghouse electric coupling for diesel engine marine propulsion drives. Printed in blue and black with profuse illustrations, this publication shows "What the coupling is and how it works." These couplings have become of especial interest to the marine fraternity since the Maritime Commission designed all of its geared diesel motorships with this type of coupling between the engine and the gears.

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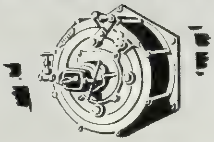

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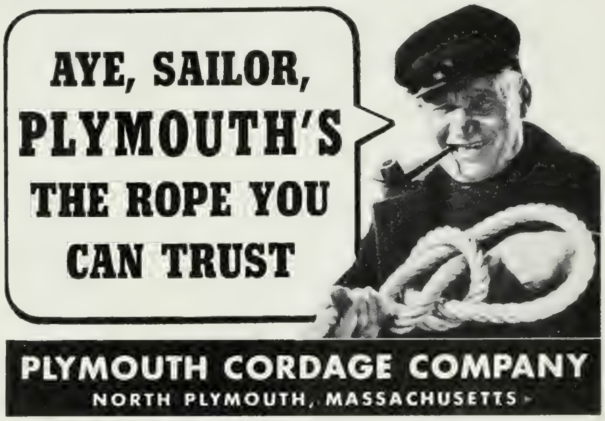

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New Marine Books

Mechanical Engineers Handbook, edited by Lionel S. Marks; 2300 pages (4½" x 7"); thumb-indexed in 16 sections; profusely illustrated with tables and diagrams; bound in red cloth with gold stampings; published by McGraw Hill Book Co., Inc., New York. Price $7.00.

This is a fourth edition of a standard work. Approximately 100 contributors have supplied material in their special fields. Most sections have been rewritten completely, and, although much new material is added, the total number of pages remains the same as the third edition, a masterly job of condensation, for which all M. E.s will be thankful.

The subsection on Marine Engineering is a very fine presentation of the essentials of practice as it exists today.

The section heads include: (1) Mathematical Tables and Weights and Measures; (2) Mathematics; (3) Mechanics of Solids and Liquids; (4) Heat; (5) Strength of Materials; (6) Materials of Engineering; (7) Fuels and Furnaces; (8) Machine Elements; (9) Power Generation; (10) Hoisting and Conveying; (11) Transportation; (12) Building, Construction and Equipment; (13) Machine Shop Practice; (14) Pumps and Compressors; (15) Electrical Engineering; and (16) Engineering Measurements and Mechanical Refrigeration.

Under each of these sections are subdivisions, i.e., under (11) Transportation, appear: Aeronautics, Automobiles, Railway Engineering and Marine Engineering.

The index is adequate and the arrangement convenient. This fourth edition of Mark's Handbook should be very popular with engineers.

It's About Time, by Paul M. Chamberlain; 490 (6" x 10") pages; profusely illustrated with drawings and half tones; bound in red cloth with gold stampings; published by Richard R. Smith, New York. Price $7.50 net.

Here is a real book on time-keepers by perhaps the greatest of American horologists. The project of preparing the book was undertaken early in 1940 by Major Chamberlain. It was to be a compilation from the more than 100 papers and articles which he had prepared during the previous 25 years for presentation to horological societies or publication in horological journals. He passed away before the work was much more than started. It was completed by his widow, assisted by his scientific and literary friends.

The result is an absorbingly interesting account of the development of watches, clocks and chronometers, illustrated with wash drawings mainly by the author, and with pictures of the more famous clock makers and of the more noted examples of their work.

This book should be in the library of every deck end engineer officer in the merchant marine and the Navy.

School of the Sea, by Comdr. Leland P. Lovette, U. S. N.; 400 (5½" x 8½") pages; 27 illustrations; bound in blue cloth with gold stampings; published by Frederick A. Stokes Co., New York. Price $3.00 net.

As a subtitle, this interesting book carries "The Annapolis Tradition in American Life." It is a very clear, well arranged, and informative history of officer training in the U. S. Navy, combined with an account of the status of that training today, and an appraisal of the effect of Annapolis on civic, industrial and scientific America.

The author's style is vigorous and his diction salty. Both seagoing and rocking-chair sailors will find much authentic information and many healthy chuckles in this book.

The Engineering Profession, by Professors T. J. Hoover and J. C. L. Fish; 450 pages, with numerous diagrams and tables; bound in green buckram with gold stampings; published by the Stanford University Press. Price $5.00 net.

This book, which represents a very considerable volume of research work, is an analysis of the professional engineer—his qualifications, duties, habits of mind—and of the engineering profession—its sphere, status, rewards, capacities for future development.

The data used are in considerable measure derived from a questionnaire which the authors sent out to numerous professional engineers, and from whom they received some fourscore replies.

Study of this work should be especially valuable to the vocational counselor and to young men thinking of an engineering career. To experienced engineers it will be à source of inspiration and encouragement to find their profession.

The Federal Wage and Hour Law, by Arthur W. Nevins; 60 (5" x 8") pages; bound in red cloth with silver stampings; published by the National Foremen's Institute. Price $1.50 net.

This is a very handy manual of questions and answers on the Wage and Hour Law. It is especially designed for executives, department heads and supervisors. It covers practically all rulings up to a point very close to its publishing date of October, 1941.

FOR SALE—Two new 500 H.P. Triple Expansion Marine Engines complete with thrust bearings. For particulars inquire Marine Electric Company, 2121 N. W. Thurman, Portland, Oregon.